

GROWING OUR FOOD FUTURE





VISION
SAFE FOOD FOR ALL

MISSION
TO ENSURE AND SECURE A SUPPLY
OF SAFE FOOD

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AWARDS AND ACCOLADES

Workplace Partnership Award (Platinum) 2020

From Ong Teng Cheong Labour Leadership (OTC) Institute

Public Sector Pro-Enterprise Initiative Gold Award

for “Food and Groceries on Wheels in HDB Car Parks to Help Residents Through COVID Circuit Breaker and Beyond”

FROM THE MINISTRY OF SUSTAINABILITY AND THE ENVIRONMENT (MSE)

- **Agility Award 2021** for “Accelerating local food production and enabling connectivity for food resilience” and “Operationalising Safe Management Measures for MSE family: Resource Management, Coordination, Enforcement”
- **Citizen Engagement Award 2021** for “Citizens’ Workgroup on Increasing Demand for Local Produce”
- **Commendation Award 2021** for “Rethinking Enforcement through CCTV and Shaping Narrative”
- **Dare to Do Award 2021** for “Pioneering an Aquaculture Nutrition Facility at the Marine Aquaculture Centre”
- **Exemplary Leader Award 2021** for Angela Li, Chang Tze Ai, Jiang Jun Hui, and Tan Siow Hwei
- **Innovator Award 2021** for “Sharpening food safety monitoring practices using science-backed, risk-based technologies”
- **One Public Service Award 2021** for “Enabling Growth of Safe Novel Foods Ecosystem through a Science-Based Regulatory Framework” and “Food Groceries on Wheels: Bringing Daily Essentials Closer to Vulnerable Groups”
- **Regulatory Excellence Award 2021** for “Ensuring Supply of Safe Food: Facilitating Exports, Farms Establishment and Novel Foods”
- **Service Excellence Award 2021 (Individual)** for Choo Yong Cheong, Lim Xiu Qing Joyce, Tan Yit Wee
- **Service Excellence Award 2021 (Team)** for “Enhancing Testing Capabilities of Laboratory Recognition Programme (LRP) Laboratories”
- **SkillsFuture Award 2021** for Caitlin Lau and Yeung Chun Yin Johnny

RECEIVED BY THE NATIONAL CENTRE FOR FOOD SCIENCE (NCFS)

- World Health Organization (WHO) Collaborating Centre for Food Contamination Monitoring (2020-2024) designation, received by the Food Safety Monitoring and Forensics Department
- ISO/IEC 17025 SAC-SINGLAS Accreditation (since 2000), with 19 new tests accredited in FY2020
- World Health Organization Collaborating Centre for Food Contamination Monitoring designation (since 1992)
- World Organization for Animal Health (OIE) Collaborating Centre for Food Safety designation (since May 2014)
- ASEAN Reference Laboratory for Mycotoxins designation (since 2004)
- ASEAN Reference Laboratory for Pesticide Residues designation (since 2004)
- ASEAN Reference Laboratory for Environmental Contaminants designation (since 2014)
- ASEAN Reference Laboratory for Marine Biotoxins and Scrombotoxin designation (since 2019)

MESSAGE FROM THE CHAIRMAN



Mr Lim Chuan Poh
Chairman

When the Singapore Food Agency (SFA) was formed in 2019, we recognised that food security was existential to Singapore. We articulated our ambitious ‘30-by-30’ target while continuing to diversify import sources.

CONFRONTING A DYNAMIC LANDSCAPE

These early efforts provided Singapore with some buffer when the COVID-19 pandemic struck in early 2020. Countries swiftly closed their borders to slow the spread of the virus. Airlines were grounded and containers were stuck at the ports. For Singapore, COVID-19 accentuated our vulnerabilities to global supply disruption. It introduced new shifts in global supply chains. Resilience was valued over efficiency, as plans evolved from “just-in-time” to “just-in-case”.

Meanwhile, changes in the climate continue to threaten food safety and security. The United Nations Food & Agriculture Organization reported in 2020 that warmer temperatures were causing more infections by foodborne pathogens, reducing the efficiency of pesticides due to volatilisation while increasing eutrophication in waterbodies and harmful algal blooms in oceans. These would impact Singapore as we develop our aquaculture sector and sea space to achieve the ‘30-by-30’ target.

It is clearly no longer business-as-usual for SFA to ensure and secure a supply of safe food for Singapore.

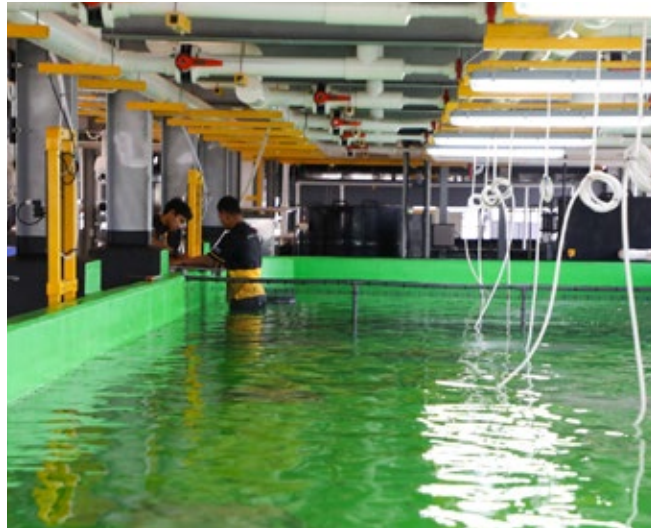
RESPONDING WITH SPEED AND AGILITY

When COVID-19 happened, SFA stepped up to coordinate the deployment of the Safe Distancing Ambassadors and Social Distancing Enforce-

ment Officers across agencies to enforce safe distancing measures. Meanwhile, we monitored the food supply situation and worked with relevant partners to ensure that there were adequate food supplies for Singaporeans.

Plans to boost food resilience through local production were accelerated. The “30x30” Express Grant call was launched in April 2020, to support local best-in-class farms in accelerating their production. We announced opportunities to leverage rooftops of vacant Housing & Development Board multi-storey carpark for commercial farm-





ing. In parallel, as part of our sustainability efforts, we needed to be innovative, both in resource utilisation and farming technologies in the master planning of the Lim Chu Kang area which was announced in October 2020. Plans are underway to engage different stakeholders to solicit ideas so that we can create a high-tech, highly productive and resource-efficient agri-food cluster.

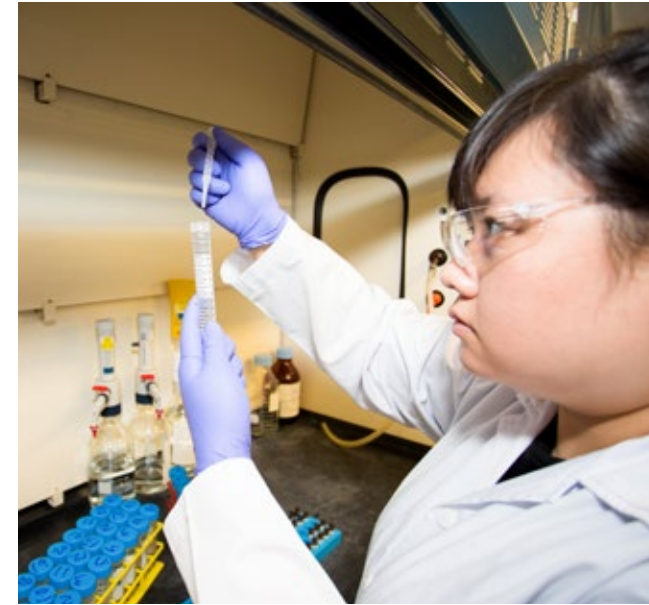
Research and development (R&D) is a pivotal pillar driving the innovation of agri-food technologies and products. The Government had earlier set aside \$144 million of research funding under the Singapore Food Story (SFS) R&D Programme to catalyse R&D in sustainable urban food production, future foods, and food safety science and innovation. In October 2020, a new facility was also established in SFA's Marine Aquaculture Centre to deepen our capabilities in fish nutrition and feed development.

As we ramped up local production, there was a need to increase consumer awareness of local produce. The SG Fresh Produce logo was introduced in June 2020, to help consumers identify local produce easily. SFA also launched the #fromSGtoSG integrated marketing communications campaign in August 2020, to promote the consumption of local produce. Ideas were crowd-sourced from a Citizens' Workgroup through a series of workshops. This resulted in two pilot projects that would show first-time mothers the benefits of eating local produce, and how to readily identify local produce in wet markets.

To enable the growth of a vibrant food ecosystem in Singapore, SFA pioneered the regulatory framework for novel foods, placing Singapore on the world map as being the first country to approve the commercial sale of cell-based meat for local consumption, i.e. that of EAT Just's cultured chicken nuggets. A new Laboratory Rec-

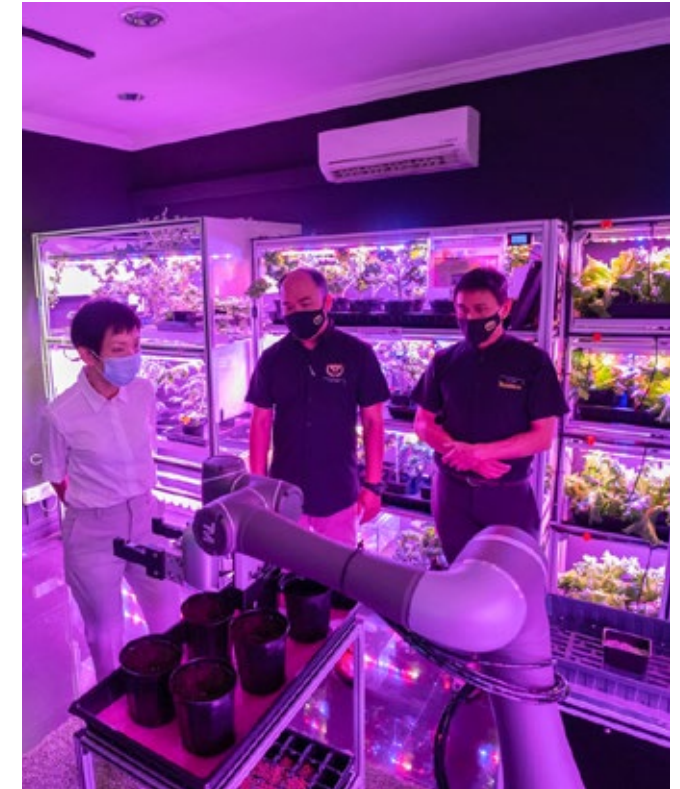


Feed facility in the Marine Aquaculture Centre



ognition Programme (LRP) was also introduced to enhance the recognition of private testing laboratories by food industry players and foreign competent authorities. This would help build local industry capabilities in testing, inspection, and certification.

On the international front, SFA's Food Safety Monitoring and Forensics Department, under the National Centre for Food Science (NCFS), has been designated as a World Health Organization (WHO) Collaborating Centre for Food Contamina-



tion Monitoring in the world from 2020 to 2024. This designation is a testament to NCFS's food testing and research capabilities, and enhances Singapore's reputation for food safety.

TRANSFORMING THE SINGAPORE FOOD SYSTEM TOGETHER

To achieve our mission of ensuring and securing a supply of safe food, we welcome more collaborations with industry partners, institutions of higher learning and research institutes to nurture a sustainable, safe food eco-system. SFA will continue to help local agri-food companies scale and expand to the region, and exploit enabling technologies. We will also deepen our capabilities in food science and smart regulation, as we shape policies in tandem with new market innovations. As food safety is a joint responsibility, SFA will continue to work with industry and consumers to build their capabilities and educate them on their roles in ensuring food safety.

LIM CHUAN POH (MR)
CHAIRMAN, SFA



BOARD OF DIRECTORS



Mr Lim Chuan Poh
Chairman



Mr Lim Kok Thai



Mr Andrew Kwan



Ms Han Yong May



Dr Ho Kim Wai



Mr Krishnan Muthappan



Prof John Lim



Mr Jim Lim



Mr Ong Chao Choon



Mr Pier Luigi Sigimondi



Ms Thien Kwee Eng



**Mr Mohd Fahmi
Bin Aliman**

BOARD OF DIRECTORS

Mr Lim Chuan Poh (Chairman)

- Non-resident Ambassador to Israel, Ministry of Foreign Affairs
- Chairman, Lee Kong Chian School of Medicine Governing Board
- Board of Trustees, Asia Pacific Breweries Foundation
- Board of Trustees, Nanyang Technological University
- Senior Scientific Advisor to MINDEF
- Board and Council Member, Science and Technology in Society Forum
- Member, Japan's World Premier International Initiative Programme Assessment and Review Committee
- Special Committee Member, Japan Science and Technology Agency Advisory Committee
- Council Member, University of Illinois System President's Advisory Council

Mr Lim Kok Thai

- CEO, Singapore Food Agency
- Board Director, AgriFood Technologies Pte. Ltd.
- Member, Tropical Marine Science Institute Management Board

Mr Andrew Kwan

- President, Restaurant Association of Singapore
- Deputy Chairman, Focus on the Family
- Deputy Honorary Secretary, Singapore Business Federation
- Chairman, Aquaculture Innovation Centre
- Non-Resident Ambassador to the Kingdom of Sweden, Ministry of Foreign Affairs
- Member, Info-communication Media Development Authority
- Chairman, Globamatrix Holdings Pte. Ltd
- Chairman, Commonwealth Retail Concepts Pte. Ltd.
- Director, Spinnaker360 Pte. Ltd.
- Chairman, Commonwealth Capital Pte. Ltd.
- Director, NPE Print Communications Pte. Ltd.
- Director, Commonwealth Harvests Pte. Ltd.
- Director, Barramundi Asia Pte. Ltd.
- Chairman, Bakematrix Pte. Ltd.
- Chairman, Swiss-Bake Pte. Ltd
- Chairman, Commonwealth Culinary Creations Pte. Ltd.
- Chairman, Commonwealth Food Services Pte. Ltd.
- Chairman, Zac Meat & Poultry Pte. Ltd.
- Director, Barramundi Asia Holdings Pte. Ltd.
- Director, Commonwealth Food Solutions Pte. Ltd.
- Director, Baker & Cook Pte. Ltd.
- Director, Metro Graphic Pte. Ltd
- Director, Metro Packaging Pte. Ltd.
- Director, The Soup Spoon Pte. Ltd.
- Director, SouperFoods Pte. Ltd.
- Director, &Willin Pte. Ltd.
- Director, Kokubu Commonwealth Trading Pte. Ltd.
- Director, Smorgasbord International Pte. Ltd.
- Shareholder, Marine Produce Australia Ltd
- Shareholder, MPA Fish Farm Pty Ltd
- Shareholder, MPA Marketing Pty Ltd
- Director, Commonwealth Kokubu Logistics Pte Ltd
- Shareholder, Barramundi Asia (B) Sdn Bhd
- Shareholder, Edamummy Pte Ltd
- Shareholder, Peas Not War Pte. Ltd.
- Director, Fassler Gourmet Pte Ltd
- Director, Commonwealth Concepts Pte Ltd
- Director, Commonwealth Restaurant Holdings Pte Ltd
- Director, Commonwealth Logistics II Pte Ltd
- Director, Commonwealth Ventures Pte Ltd
- Director, Commonwealth Ventures II Pte Ltd
- Director, Float Pte Ltd
- Director, SGProtein Pte Ltd

Ms Han Yong May

- Editor, Chinese Media Group NewsHub, Singapore Press Holdings

Dr Ho Kim Wai

- Associate Professor, Banking & Finance, Nanyang Business School, Nanyang Technological University (till 30 Sep 2021)

Mr Krishnan Muthappan

- Board Member, Hindu Endowment Board
- Finance Member, Hindu Endowment Board
- Director & Shareholder, Markham Agro Pte. Ltd.
- Director, Markham Agro (19 HK) Pte. Ltd.
- Director & Shareholder, Meleri Capital Pte. Ltd.

Prof John Lim

- Executive Director, Centre of Regulatory Excellence, Duke-NUS Medical School
- Senior Advisor, Ministry of Health
- Chairman, Consortium for Clinical Research & Innovation Singapore
- Board Member, St Andrew's Mission Hospital
- Council Member, Advertising Standards Authority of Singapore (ASAS)
- Member, US Pharmacopoeia Council of the Convention & Chair, Asia-Pacific Regional Chapter
- Member, Executive Board, APEC Life Sciences Innovation Forum
- Advisor, Mobile-health Network Solutions (MaNaDr)
- Member, Leadership Group of Davos Alzheimer's Collaborative

Mr Jim Lim

- Partner and Head of Department, Intellectual Property and Technology, Withers KhatterWong LLP (Partner till 31 Jul 2021)

Mr Ong Chao Choon

- Partner, PricewaterhouseCoopers and related entities
- Board Member, Art House Limited (till 31 May 2021)
- Board Member, Community Foundation of Singapore
- Board Member, Lee Kuan Yew Fund for Bilingualism

Mr Pier Luigi Sigimondi

- President, Worldwide Packaged Foods, Dole Asia Holdings Pte Ltd

Ms Thien Kwee Eng

- Board Member, Singapore Tourism Board
- Board Member, Singapore Food Agency
- Board Member, Sentosa Development Corporation
- Director, Sentosa Leisure Management
- Director, Sentosa Cove Resort Management
- Director, Mount Faber Leisure Group

Mr Mohd Fahmi Bin Aliman

- Director, Operations and Mobilisation, National Trades Union Congress
- Deputy Executive Secretary, Supply Chain Employees' Union (till 31 Jul 2021)

LEADERSHIP TEAM



Mr Lim Kok Thai
Chief Executive Officer



Dr Tan Lee Kim
Director-General,
Food Administration &
Deputy CEO



Mr Chan Hian Lim
Deputy CEO
(Corporate, Industry, and
Technology)



Mr Melvin Chow
Senior Director,
Food Supply Resilience
Division



Ms Lim Melin
Senior Director,
Urban Food Solutions
Division



Dr Choo Li Nah
Senior Director,
Communications & Service
Quality Division



Dr Astrid Yeo
Senior Director,
Food Regulatory
Management Division



Ms Siti Suriani
Senior Director,
Licensing & Permits
Division



A/P Joanne Chan
Centre Director,
National Centre for Food
Science



Mr Kevin Khng
Senior Director,
International Relations
Division



Ms Kho Soo Pei
Senior Director,
Corporate Development
Division



Dr Abdul Jalil
Senior Director,
Joint Operations Division



Dr Hazel Khoo
Senior Director (RIE2025),
Science & Technology
Division



Dr Alvin Yeo
Senior Director,
Planning & Organisation
Division



Ms Cheong Lai Peng
Senior Director, Industry
Development & Community
Partnership Division

CORPORATE GOVERNANCE

The SFA Board and Leadership Team have put in place a framework for adherence to good corporate governance practices. The SFA Act governs the work of SFA and its Board. Board members hail from a broad range of fields from both the public and private sectors, providing a spectrum of expertise and depth of experience to the organisation.

INTERNAL CONTROL FRAMEWORK

SFA has in place an organisation-wide system of internal controls, which includes:

- An organisational structure with clear definitions of responsibility and reporting mechanisms at different levels of the organisation.
- Documented policies and procedures, proper segregation of duties, approval procedures and authorisations, and checks and balances built into SFA's processes.
- Systems to safeguard assets, maintenance of proper accounting records, reliability of financial information, compliance with appropriate legislation, regulations, and best practice.
- Financial Regulations that set out financial policies, procedures, and financial authority on the various operations in SFA.
- A Code of Conduct that lays out the values and key principles governing the conduct of officers, and provides guidance as they carry out their daily work.
- A whistleblowing policy that allows officers and external parties to report on fraudulent and wrongful practices.
- Independent internal audit function and external audit functions.

These internal control systems are designed to manage risks rather than to eliminate the risk of failure, and provide only reasonable, and not absolute, assurance against fraud, material misstatement or loss.

INTERNAL AND EXTERNAL AUDIT FUNCTIONS

The Internal Audit Unit operates independently from other Divisions in SFA, and reports to the SFA Board's Audit and Risk Committee. The Internal Audit Unit advises SFA's management and the Audit & Risk Committee on the system of internal controls in SFA. Reviews performed by the Unit help the Board in promoting good corporate governance by assessing the design and operating effectiveness of the controls. The reviews also focus on compliance with government instruction manuals and SFA's policies and procedures.

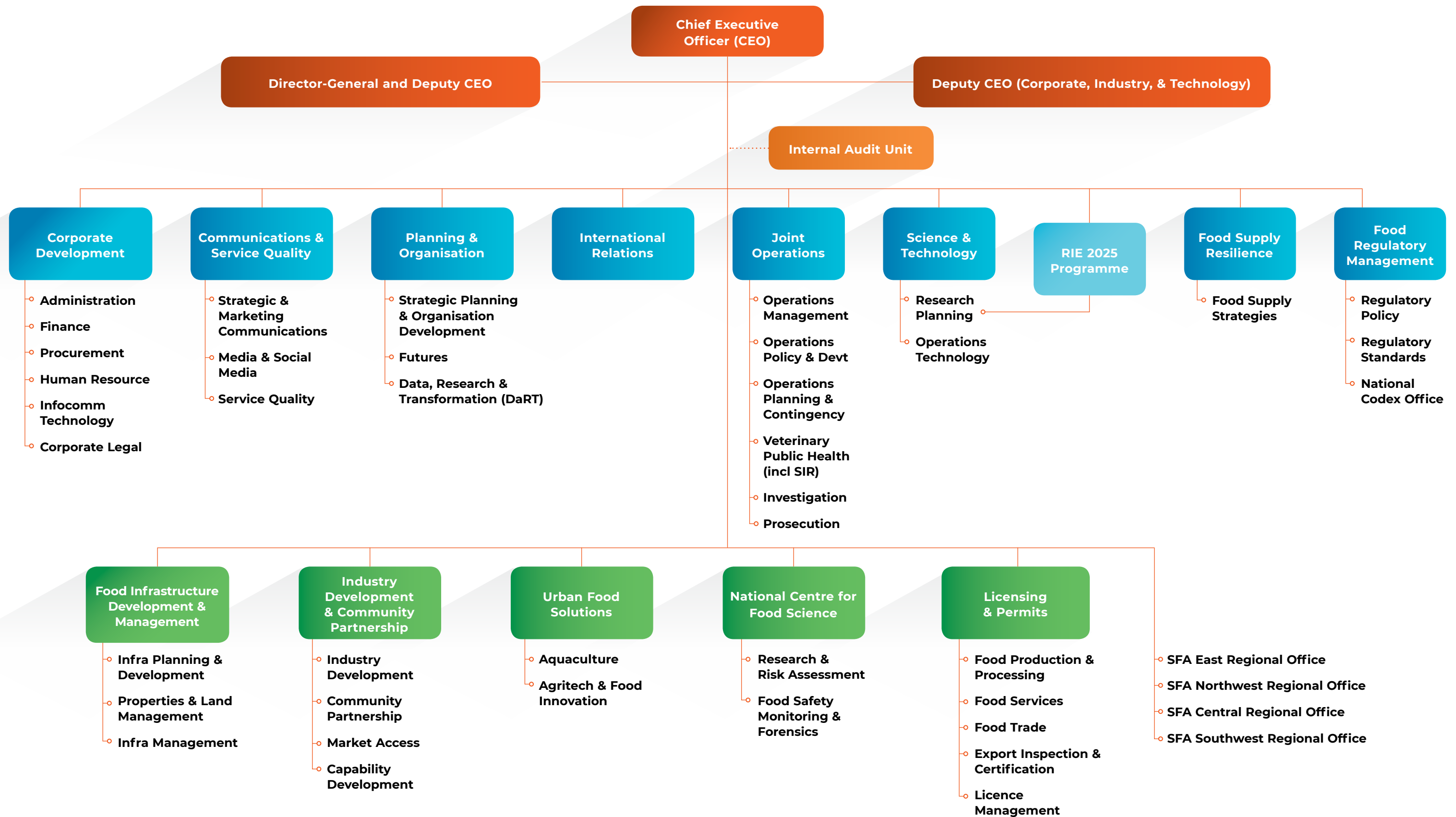
SFA's accounts are audited by the Auditor-General's Office of Singapore or such other auditor that may be appointed by the Minister for Sustainability & the Environment in consultation with the Auditor-General. The external auditor engaged for the financial year, which ended on 31 March 2021, was BDO LLP. The external auditor reports its audit findings and recommendations to SFA Board's Audit and Risk Committee. SFA's Board approves the accounts and forwards the audited statements to the Ministry of Sustainability & the Environment and Auditor-General's Office.

BOARD COMMITTEES

As part of corporate governance, Board Committees comprising Board members are formed to review financial matters such as changes in accounting practices, financial regulations, and procedures. It also reviews and endorses audit plans and reports, control improvements, risk management frameworks, and policies.

The Audit & Risk Committee assists the Board to provide guidance and advice on strengthening SFA's financial reporting process, internal controls, and risk management. Chaired by Mr Ong Chao Choon, the Audit & Risk Committee comprises Prof John Lim and Mr Jim Lim.

ORGANISATIONAL CHART





FEEDING OUR NATION

Safeguarding Our
Food Supply



We plant the seeds of food security far and wide, so that Singaporeans can always enjoy a wide variety of safe food on their tables. By planning for the long term, we secure Singapore's food supply for current and future generations.

SAFEGUARDING OUR FOOD SUPPLY

SFA proactively plans for the long term when it comes to safeguarding Singapore’s food supply. To feed the nation, we adopt the strategy of ‘three food baskets’:



PER CAPITA CONSUMPTION AND IMPORT VOLUMES
OF THE COMMONLY CONSUMED FOOD ITEMS
(JAN-DEC 2020)

	Per Capita Consumption	Import volumes
Fruits	72 kg	427,697 tonnes
Leafy vegetables	16 kg	80,434 tonnes
Other vegetables	82 kg	478,618 tonnes
Chicken	36 kg	230,929 tonnes
Duck	2 kg	12,215 tonnes
Pork	22 kg	128,353 tonnes
Mutton	2 kg	14,835 tonnes
Beef	4 kg	33,519 tonnes
Hen shell eggs	388 pieces	1,607m pieces
Fish	16 kg	100,264 tonnes
Other seafood	6 kg	34,074 tonnes

Note: All meat and seafood are in live, chilled, and frozen forms; vegetables and fruits are in fresh and chilled forms.

MAJOR SOURCES OF SUPPLY OF THE MOST COMMONLY CONSUMED FOOD ITEMS
(JAN-DEC 2020)



BASKET 1: DIVERSIFYING IMPORT SOURCES

More than 90 percent of our food is imported from over 170 countries/regions overseas. Singapore’s food importers leverage the nation’s connectivity and global free trade environment to import from multiple sources. Should there be a disruption to any one source, importers can tap on alternative sources to minimise the impact and ensure our food supply remains stable.

ACCREDITING NEW IMPORT SOURCES

SFA actively accredits new import sources to support the diversification of our supplies. In FY 2020, we accredited 122 new farms and establishments as additional sources of food, such as eggs, poultry, and pork.

SFA requires meat and meat products, including poultry and eggs, to be imported from accredited sources that meet our food safety and animal health standards and requirements. Accreditation is necessary as these products can carry food safety risks and animal diseases. In FY 2020, SFA continued to support importers in their diversification efforts while tightening food safety protocols.

REVISING CRITERIA FOR IMPORTED CHILLED POULTRY

In May 2020, SFA revised its accreditation criteria and import conditions for chilled poultry to enable a greater variety of food imports into Singapore. Chilled poultry was previously not allowed to be imported as it poses a higher risk than frozen poultry due to its shorter shelf life, which may lead to potential spoilage and presence of pathogenic bacteria. In FY 2020, following a risk assessment of countries or regions that intend to export chilled

poultry to Singapore, SFA updated its requirements to stipulate that importers must first be accredited for frozen poultry imports, and have a proven track record of exports to Singapore before they are allowed to export chilled poultry to Singapore. In addition, individual establishments interested to export chilled poultry to Singapore must provide shelf life studies and packaging information for SFA’s evaluation. In FY 2020, SFA approved the export of chilled poultry to Singapore from Australia, France, New Zealand, and Thailand.

ACCREDITING NEW EGG SOURCES

Following assessments of overseas competent authorities’ food safety and animal health regulatory systems, SFA ap-

proved the export of eggs to Singapore from three additional countries – Netherlands, Poland, and Finland, bringing the total number of approved countries for eggs to 14. SFA also accredited an additional 33 layer egg farms in approved countries in FY 2020.

MONITORING BUSINESS CONTINUITY MEASURES OF EGG IMPORTERS

Business continuity plans (BCPs) are important for food traders to mitigate the impact of food supply disruptions and maintain operational viability during unanticipated supply shocks. Since early 2019, egg importers have been required to submit a BCP as part of their licence application and annual renewal. In FY 2020, SFA continued to engage and support



TOP 3 SUPPLY SOURCES OF MOST COMMONLY CONSUMED FOOD ITEMS (JAN-DEC 2020)

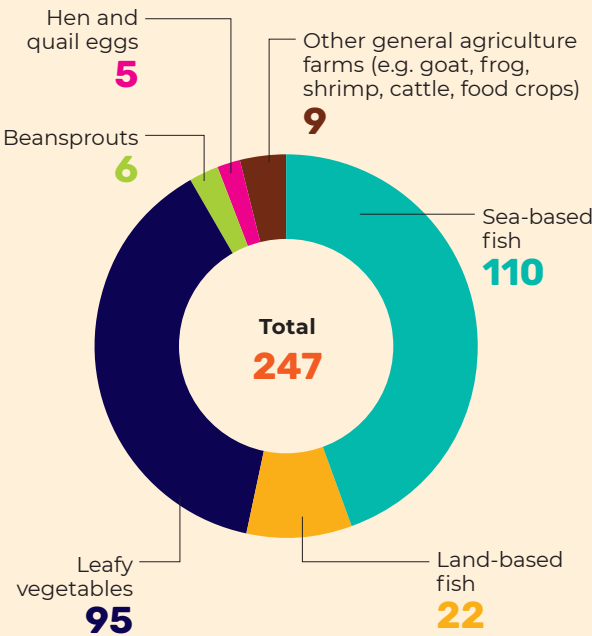
	Australia	Brazil	China	Indonesia	Ireland	Malaysia	New Zealand	Singapore	South Africa	Thailand	USA	Vietnam
Fruits												
Leafy vegetables												
Other vegetables												
Chicken												
Duck												
Pork												
Mutton												
Beef												
Hen shell eggs												
Fish												
Other seafood												

LOCAL FARM PRODUCTION (JAN-DEC 2020)

Food item	Production volume (total)	As a percentage of consumption
Fish [^]	3,960 tonnes	8%*
Other Seafood	607 tonnes	
Leafy vegetables	11,656 tonnes	13%
Other vegetables	11,137 tonnes	
Poultry (hen eggs)	616m pieces	28%

[^] Refers to local farm production figures only, excluding local landings
* Refers to local farm production as a % of fish (live and chilled only) consumption

LICENSED FOOD FARMS IN SINGAPORE (APR 2020 – 31 MAR 2021)





importers to fulfil their BCP requirements through various channels, such as an industry-wide virtual engagement session, as well as one-to-one clinics. Since January 2021, egg importers have also been subject to monthly assessments by SFA to ensure that they follow their BCPs.

MANAGING KEY FOOD DISTRIBUTION NODES

Wholesale centres are key distribution nodes in Singapore's food supply chain. SFA oversees two fishery ports and a fruit and vegetable wholesale centre to facilitate the smooth importation of food.

SFA manages the Jurong Fishery Port (JFP) and Senoko Fishery Port (SFP), which serve as wholesale and distribution centres for locally sourced and imported fish and seafood. In addition to the sea route, imported fish and seafood come via land and air routes as well. In FY 2020, there were 128 vendors in JFP and 28 vendors in SFP, and the majority of fishes handled at the ports came from Indonesia, Vietnam, Malaysia, Norway, and Thailand.

Vessel calls and fish volumes handled by JFP & SFP (FY 2020)		
Fishery ports	Vessel calls handled	Seafood volumes handled
JFP	2,606	43,932 tonnes
SFP	5,62	5,040 tonnes

SFA also manages the Pasir Panjang Wholesale Centre (PPWC), the main wholesale and distribution centre for local and imported fruits and vegetables. In FY 2020, there were 370 tenants in PPWC. In FY 2020, the majority of vegetables sold at PPWC were from Malaysia, China, India, Australia, and Indonesia, and top five sources of fruits were Malaysia, China, South Africa, Australia, and the Philippines. Malaysia, China, South Africa, Australia, and the Philippines.

BASKET 2: BOOSTING LOCAL PRODUCTION

Producing food locally enhances Singapore's food security, especially in times of supply disruption. SFA pushes the frontiers of innovation to grow food in our city – not just productively, but also in ways that are sustainable for the environment and future generations of Singaporeans.

In February 2019, the government announced plans to build up the local agri-food industry's capability and capacity to produce 30 percent of our nutritional needs locally and sustainably by 2030.

PLANNING FARM SPACES FOR THE LONG TERM

Singapore has about one percent of land dedicated to agriculture. Given such constraints, we need to adopt a holistic and long-term approach so that we can scale up local farm production. At the same time, we are also identifying alternative spaces for farming and developing innovative ways to intensify production in an urban setting.

MASTER PLANNING LIM CHU KANG

In October 2020, SFA announced plans to embark on a holistic exercise to master plan the Lim Chu Kang area into a hi-tech agri-food zone that can raise food production in a sustainable and resource-efficient manner.

As part of the consultative process, SFA has been engaging stakeholders, such as the Singapore Agro-Food Enterprises Federation Limited (SAFEF), Kranji Countryside Association (KCA), and Fish Farmers Association of Singapore (FFAS)



to rally their support and seek their input on the types of infrastructure and shared facilities required to better support farms of the future in Lim Chu Kang. SFA will also continue to

engage with food farms, non-food farms, nature groups, educators, solution providers, ecosystem players, members of the public, and public officers to seek their views and sugges-

tions on the master plan. These include developing the Lim Chu Kang area into a vibrant destination for recreation and education, and making it accessible to all.

TENDERING OUT FARMLAND TO PRODUCTIVE FARMERS

SFA continued to encourage, facilitate, and support the setting up of hi-tech and productive farms in Singapore, through tendering farmland. In September 2020, SFA launched the sixth tranche of farmland tenders comprising one land parcel for general agriculture (food) farming and one land parcel for vegetable farming at Neo Tiew Crescent and Sungei Tengah Road, respectively. These tenders were awarded in March 2021. Altogether, the six tranches have awarded farmland to 19 companies. These companies will help contribute to our 30 by 30 target.

BOOSTING SUSTAINABLE FISH FARMING

Besides land, SFA is also unlocking the potential of our

local sea-based farms. To ensure that our sea spaces can sustain high-yielding production in the long term, SFA has engaged the industry to understand their concerns and is working closely with the industry to uplift the aquaculture sector through a multi-pronged approach.

In addition, SFA helps fish farmers overcome land constraints, increase hatchery productivity, and ensure resilience in the local supply of quality fish fingerlings. In FY 2020, SFA provided technical advice to farmers on the design of two new floating hatcheries, and assisted in the fine-tuning of hatchery production protocols for Asian Seabass fingerlings. Floating hatchery is a new development and our efforts in FY 2020 helped a local floating hatchery achieve growth consistency between production batches through better control of culture temperature for optimum growth at larval stage. Farm technicians' knowledge and skills in hatchery technology were also upgraded through

SFA's hatchery training in broodstock management, live feed production, and larval rearing.

SFA is conducting studies on the potential of fish farming in Singapore's Southern Waters, to assess the level of fish production that can be supported by the waters without impacting site conditions. We have also been engaging with sea-based farmers on raising production and using more sustainable practices to mitigate impact on the marine environment, for continued productivity of our sea spaces.

IMPROVING PRODUCTIVITY THROUGH FLOCK MANAGEMENT

To improve productivity, farms often practise flock management. In FY 2020, SFA obtained approval from Malaysia for two local farms to export chickens and cattle from Singapore. This will provide more options for the prompt depopulation of cattle as well as spent hens that have reached the end of their laying life.

EXPLORING ALTERNATIVE SPACES FOR URBAN FARMING

Having an urban farm in the heartlands brings food production closer to the community, and raises community awareness of and support for local produce.

REPURPOSING MULTI-STOREY CARPARK ROOFTOPS FOR FARMING

In FY 2020, SFA launched two tenders for a total of 16 Housing & Development Board's (HDB) Multi-Storey Carpark (MSCP)



rooftop sites for urban farming. The sites will be used for farming vegetables and other food crops, as well as for other related purposes, such as the packing or storage of produce. Bidders for the first tender submitted proposals that included hydroponic and vertical farming systems with a variety of innovative features, such as Internet of Things, blockchain technology, and automated climate control. The other seven sites are expected to be awarded in FY 2021.

CREATING A SUSTAINABLE ECO-TOWN IN TAMPINES

SFA worked with Tampines Town Council, Tampines Residents' Network, Apollo Aquaculture Group, Netatech, and Otolith Enrichment on Singapore's first community-based circular ecosystem at 'Sustainability @ Tampines Park' for sustainable food production. Under this pilot project, residents can contribute their food waste to a Black Soldier Fly (BSF) facility, where composts will be turned into natural fertilisers for vegetables in the

park's hi-tech vertical farm. The vegetables will then be distributed or sold to the community. Features such as a tilapia pond also benefit from the BSF facility, as BSF larvae reared from food waste composts are fed as live feed to the tilapias.

BUILDING A VIBRANT ECOSYSTEM IN AGRI-FOOD TECHNOLOGY

A vibrant ecosystem in agri-food R&D can enable the industry to raise productivity and grow food more sustainably. It will also help us build Singapore's reputation as a living technological laboratory for urban food production. SFA is committed to providing funding support for R&D, and engages the industry to encourage farms to embrace innovation and technology. Each licensed food farm is also supported by a dedicated account manager from SFA who advises farmers on business development, technology adoption, and financial assistance, as well as facilitates interactions and engagements with various public agencies on farming-related matters.

CO-FUNDING THE UPSCALING OF FARM PRODUCTION

In April 2021, a new \$60 million Agri-Food Cluster Transformation (ACT) Fund was launched for application over the next five years to replace the Agriculture Productivity Fund (APF), which was closed for application on 31 December 2020. As of 31 March 2021, \$53 million have been committed from the APF to support 132 local farms growing food such as vegetables, fish, hen egg, shrimp and beansprouts.



Photo credit: MSE

OVERVIEW OF FUNDING OPTIONS AVAILABLE TO AGRI-FOOD ENTERPRISES (FY 2020)



Agriculture Productivity Fund (APF):
\$63m
allocated

- Launched in Aug 2014
- To help local farms modernise and harness innovative, sustainable technology, and advanced farming systems, as well as co-fund test-bedding of technology
- Replaced by Agri-Food Cluster Transformation (ACT) Fund in Apr 2021 (\$60 million allocated)



Amount committed
\$52.7m

Amount disbursed
\$21.6m

Projects approved
232

Projects closed
164

KEY PRODUCTIVITY OUTCOMES BY APF RECIPIENTS (CUMULATIVE AS AT END OF FY 2020)



Man-hours saved
285,054



Increased production of food-fish by
648 tonnes



Increased production of leafy vegetable by
1,700 tonnes



Increased production of hen shell egg by
46mil pieces



30x30 Express grant call:
\$39.4m
allocated

- Launched in Apr 2020
- To help the agri-food industry significantly ramp up the local production of eggs, leafy vegetables, and fish within a shorter period of time



Singapore Food Story (SFS) R&D grant call:
\$144m
allocated

- Launched in 2019 as part of Research, Innovation and Enterprise 2020 (RIE2020) plan
- To help the local agri-tech and food industry and research institutions push towards the development and use of:
 - » Sustainable urban food production
 - » Advanced bio-tech-based protein production
 - » Food safety science and innovation

FUNDING R&D PROJECTS ON SUSTAINABLE URBAN FOOD PRODUCTION, FUTURE FOODS, AND FOOD SAFETY SCIENCE AND INNOVATION

SFA and the Agency for Science, Technology and Research (A*STAR) jointly developed the Singapore Food Story (SFS) R&D Programme to drive research in sustainable urban food production, future foods, and food safety science and innovation. A total of \$144 million had been allocated for this programme as part of the government's Research, Innovation and Enterprise 2020 (RIE2020) plan. Projects were awarded under two broad themes in FY 2020, namely: (1) Sustainable Urban Food Production; and (2) Future Foods: Alternative Proteins.

Under Theme 1, SFA awarded over \$23 million in March 2021 to 12 projects in the domain of aquaculture and urban agriculture, which covered key research areas of genetics, disease and health management, systems and conditions optimisation, as well as nutrition. These proposals incorporated innovative ideas and solutions

that were aligned with the grant objectives to increase the productivity of local food producers, taking into consideration factors such as cost effectiveness, resource use efficiency, sustainability, and climate resilience.

For example, one of the proposals will explore genomic breeding technologies to develop leafy vegetables suitable for indoor growth conditions, with the aim to improve yield, growth rate, and the quality of indoor farmed crops. Another proposal aims to develop a vaccine for the Scale Drop Disease Virus (SDDV) that affects seabass. There is currently no known vaccine for SDDV and if the development of the vaccine is successful, Singapore will have the potential to be a regional producer and supplier of autogenous vaccine.

Under Theme 2, the grant was administered and awarded by A*STAR to research projects in the areas of plant-based proteins, microbial proteins, and cultivated meats. These awarded projects will help to build up the alternative protein industry



across the value chain in Singapore.

CONDUCTING R&D IN TROPICAL FOOD PRODUCTION

In FY 2020, SFA undertook a number of R&D initiatives to drive the development of technologies and deepen Singapore's expertise in tropical urban agriculture and aquaculture. R&D projects were also initiated in collaboration with agri-food companies, Institutes of Higher Learning (IHLs), and research institutes, in which SFA provided technical inputs and shared facilities. The technical know-how was subsequently transferred to farmers to help them improve their production capabilities.

ENHANCING AQUACULTURE OPERATIONAL EFFICIENCY THROUGH AI

In FY 2019, SFA's Marine Aquaculture Centre (MAC) developed an artificial intelligence (AI) and image recognition technology together with the Government Technology Agency (GovTech) to automate the counting of rotifers – small zooplankton that are critical food for marine fish larvae. The automation of this process greatly reduced the time taken for rotifer culture management from 40 minutes to one minute. In FY 2020, SFA shared this technology with local stakeholders, including hatcheries, farms, and IHLs, and subsequently made the software available to other local and international users. Since FY 2020, this system has been adopted for daily routine use for the live feed culture at MAC. The software is being upgraded to automate the count-

ing of other types of live feed for fish larvae.

DEVELOPING A NEW SYSTEM FOR INDOOR PRODUCTION OF FISH FRY

Over the years, MAC has been developing indoor hatchery technology for fish species such as the Asian seabass. In FY 2020, an indoor tank system for the culture of the orange-spotted grouper (*Epinephelus coioides*) was successfully established in collaboration with a local hatchery, Fish Vision Agro-Tech. The survival rate for grouper fingerlings at this hatchery was improved from less than one percent to six percent through

the introduction of the Greenwater technique which involves the use of microalgae at an early larval stage. Trials were conducted at both MAC and the farm's premises to finetune the hatchery protocols. SFA also worked with other local hatcheries to improve their new indoor hatchery facilities. With SFA's technical assistance, these hatcheries successfully produced grouper fingerlings using the indoor tank system.

ESTABLISHING A SAFER METHOD TO TREAT FISH PARASITES

Farmers commonly use freshwater or formalin bath to control parasites in marine fish. While formalin is extremely effective against parasites, it is potentially hazardous to users and the environment if not correctly applied. In FY 2020, MAC studied the use of sodium percarbonate (SPC) as an alternative treatment method, which is reported to be effective against fish parasites and

approved for aquaculture use in Australia.

This study, the first of its kind done on common marine fish parasites in Singapore, found that SPC is effective and produced little toxic by-products, making it a safer alternative. The SPC treatment method was adopted and implemented at MAC to gradually phase out the use of formalin.

ATTRACTING WORLD-CLASS COLLABORATORS

An aquaculture nutrition facility was established at MAC to provide local and global animal health and nutrition researchers with an R&D-scale feed mill and experimental tank system to conduct studies on fish nutrition and feed development. In FY 2020, MAC collaborated with an international animal health and nutrition company Adisseo, and local research groups from Temasek Life Sciences Laboratory and James Cook University Singapore to undertake aquatic nutrition projects. The new facility has enabled SFA to work with world-class collaborators on projects to improve feed formulation and manufacturing to achieve healthy growth and improve feed utilisation for tropical marine fish such as the Asian seabass.

DEVELOPING NEW TECHNOLOGY TO GROW VEGETABLES ON WALLS

In FY 2020, SFA embarked on a joint pilot project with Netatech Pte Ltd to develop a hi-tech vertical vegetable farm that features a unique scaffold design that will allow the farm to be attached to any unutilised ver-



Netatech, a hi-tech, vertical vegetable farm at Tampines



Tray planting field trial of xiao bai cai grown with different ratios of BSF frass

tical space such as the sides of HDB blocks. Through this pilot, SFA will be able to determine the feasibility and productivity of such a model and potentially unlock more alternative spaces for urban farming.

DETECTING AND MANAGING PESTS

To reduce the reliance on chemical pesticides used in agriculture, SFA collaborated with the National Parks Board (NParks) on two projects in FY

2020 to develop a technology for the early detection of pests, as well as to study the efficacy of non-chemical pest management methods such as traps and biocontrol agents. Trials began in FY 2020, and results are expected to be applied in farms in FY 2021.

TRANSFORMING FOOD WASTE INTO ALTERNATIVE NUTRIENTS

As part of a circular economy, local biomass side streams such as food waste and agri-

cultural or horticultural wastes can be valorised into sustainable and alternative nutrient sources. SFA has been studying the feasibility of using Black Soldier Fly (BSF) frass as a basal fertiliser to grow vegetables, in view of increasing local interest in BSF frass as a fertiliser for agricultural purposes.

Preliminary findings have shown that BSF frass, with its sustainable nature and nutrient-rich properties, could achieve yields comparable to those that used chicken manure compost. However, in view of concerns such as the high sodium content of BSF frass, the larger-scale and longer-term application of BSF frass at farms would need to be further assessed and studied in collaboration with IHLs. SFA will be carrying out more studies on the use of BSF frass for vegetable growing and its effects on soil quality and food safety.



Sticky traps with lures (in red) to trap leaf miner pests

DEVELOPING A PIPELINE OF LOCAL AGRICULTURAL TALENT

The agri-food industry is a growth sector that will provide new jobs and exciting career opportunities for local talent in agriculture and aquaculture sciences, engineering, and in-fo-comm technology. SFA is committed to working with our partners to grow and nurture talents in our local agricultural and aquaculture sectors. In FY 2020, SFA facilitated structured internships and job matching for new entrants in the industry, as well as developed upskilling opportunities for those currently in the industry for better career progression.

GROOMING AGRI-SPECIALISTS THROUGH CERTIFICATION

In FY 2020, SFA continued with our efforts to attract and groom job seekers with skill-sets required by the agriculture and aquaculture sectors. We worked with various government agencies, IHLs, and local farms on Pre-Employment Training (PET) and Continuing Education and Training (CET) diplomas in aquaculture and agriculture. As at the end of FY 2020, there were 150 students currently enrolled in these training programmes.

SFA also collaborated with Republic Polytechnic and Temasek Polytechnic to develop programmes in agriculture and aquaculture technology. In FY 2020, we jointly developed two SkillsFuture e-learning programmes and three SGUnited Skills programmes to equip job seekers with the basic skillsets to transit into the agri-food sector. About 700 individuals

were trained under these five programmes.

Additionally, to meet manpower needs for higher-order skills and for career progression, we partnered the National University of Singapore (NUS) to offer graduate certifications in urban farming biotechnology in August 2021.

IGNITING STUDENTS' PASSION FOR FOOD PRODUCTION

SFA continues to work closely with IHLs and local farms to provide structured internships and Work-Study programmes for students interested to pursue careers in our agriculture and aquaculture sectors. In FY 2020, about 20 students were matched to local food farms, with some joining the farms upon graduation.

Besides farms, SFA also welcomed 10 interns from polytechnics and universities,

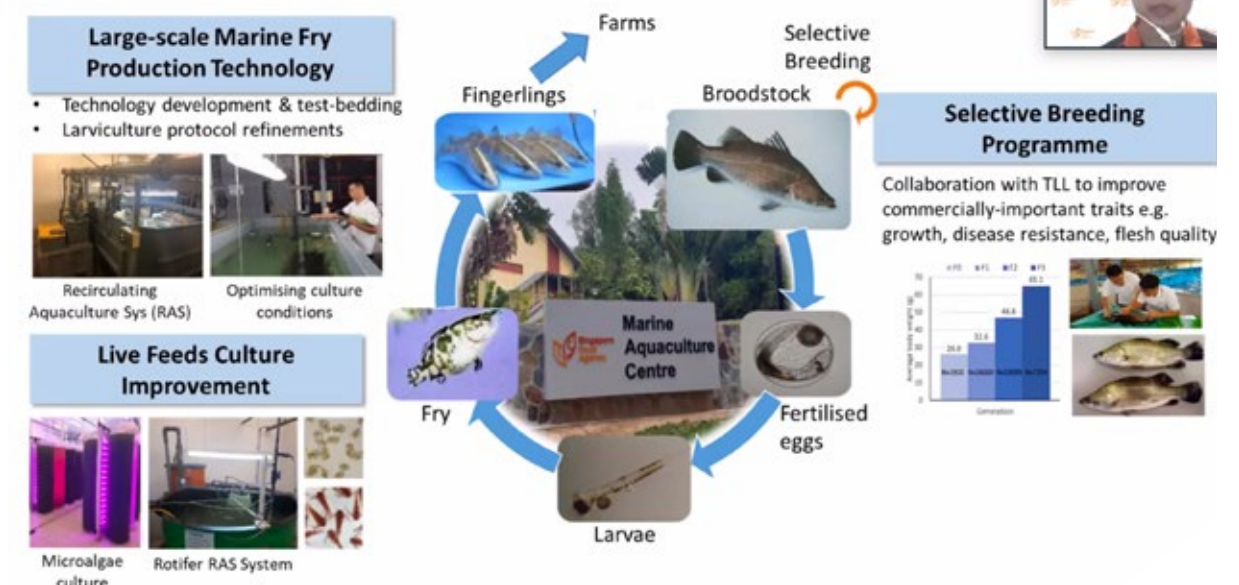
providing them opportunities to gain insights to our work in urban food solutions. Interns attached to the indoor agriculture section observed and participated in the entire growth process of fruited and leafy vegetables in selected experiments, while those at MAC gained hands-on experience and knowledge in general aquaculture practices through visits to local fish farms.

At the pre-tertiary level, SFA mentored nine National Junior College students on four projects related to agriculture and crop planting in FY 2020. This was part of Project Cube/Roots, Singapore's first urban agriculture research facility in a junior college, for the research and development of innovative, sustainable agri-tech solutions for the production of healthy food. The projects covered topics such as pest management for Brassica oleracea



An intern working on an indoor vertical growing system for vegetables

Key R&D Initiatives at MAC



Screenshot of a virtual learning journey to MAC

and fertilisers for microgreens. They also studied the bioremediation of surface water using Moringa seed extract, and the protein levels in different leafy Amaranthus varieties in Singapore.

SFA also organised dedicated learning journeys to MAC for students from the School of Science and Technology, Singapore to pique students' interests in R&D efforts and techniques that would enable large-scale production of food fish. During the COVID-19 Circuit Breaker period, MAC hosted students virtually via video tours and subsequently organised five physical learning journeys for small groups of students when restrictions were eased.

MATCHING TALENTS TO AGRI-FOOD JOBS

To encourage farms to hire locals and to facilitate job matching, SFA guided farmers in

advertising job vacancies via the MyCareersFuture job portal. We also worked with farmers to raise the visibility of agri-food job vacancies by participating in thematic Virtual Career Fairs. In FY 2020, more than 2,000 job applications were received for 150 job vacancies offered by 45 farms. The majority of the job vacancies were filled within a month.

DRUMMING UP DEMAND FOR LOCAL PRODUCE

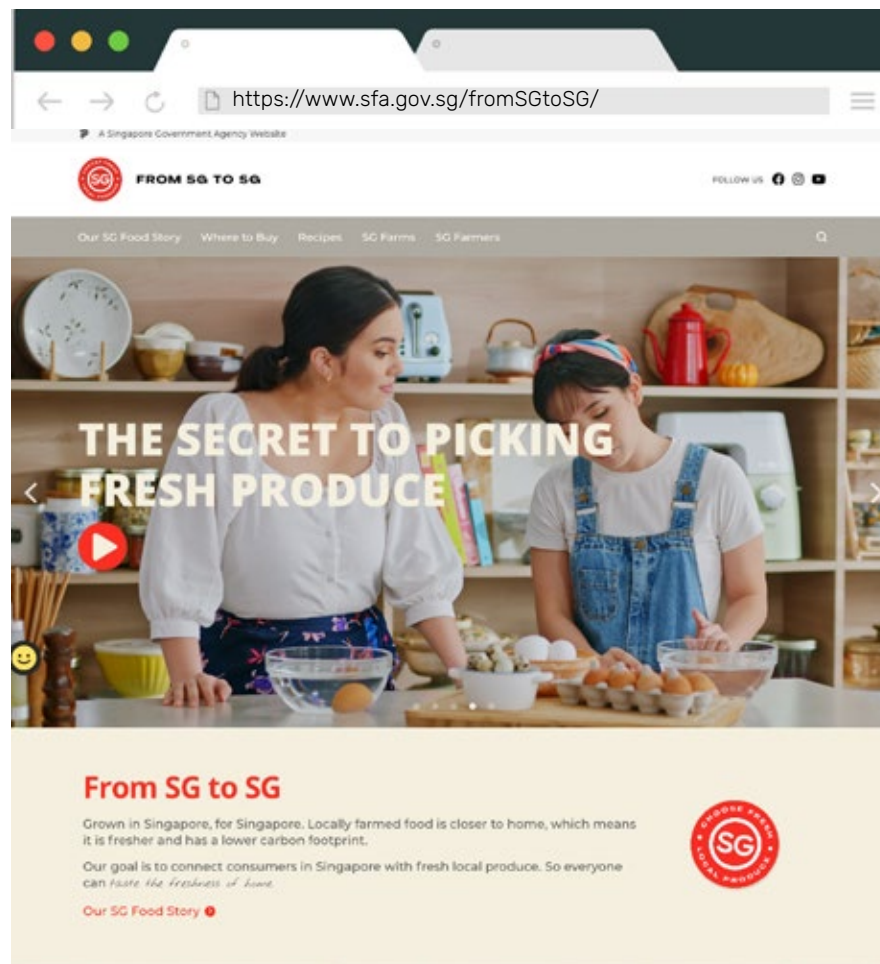
In FY 2020, SFA continued to engage consumers, students, and various organisations to encourage them to choose local produce and support our farmers through various outreach efforts such as virtual talks and learning journeys. Their spending choices support the businesses of local farmers and will contribute towards Singapore's food security. In tandem with encouraging consumers to support local produce, we also raised their appreciation and

awareness of food security in Singapore through various engagement sessions.

DEBUTING THE #FROMSGTOSG CAMPAIGN

In February 2020, together with the then-Ministry of Environment and Water Resources (MEWR), SFA launched the '2020: Singapore Food Story' campaign to raise awareness of Singapore's food security. SFA also debuted a series of integrated marketing communications initiatives in August 2020 under the '#fromSGtoSG' theme to encourage consumers to increase consumption of local produce.

The #fromSGtoSG campaign featured a series of creative visuals highlighting our key local produce, which were placed as advertisements at bus stops island-wide as well as on social media. We also launched a microsite and videos to provide consumers with information



An original recipe featuring local produce by chef Eric Neo

on the Singapore Food Story, featuring local farms and farmers and highlighting the benefits of local produce and where consumers could buy them. On top of that, we worked with digital content creators to publish articles and videos that provided consumers with interesting insights into local farms and the types of local produce available.

In addition, SFA partnered with Mediacorp to feature local produce on the popular televised cooking competition, MasterChef Singapore Season 2. This included a challenge that required contestants to create a new Singapore national dish using local produce. The programme also featured a local fish farm and a special guest appearance by Chef LG Han, who is known for advocating the use of local produce in his cooking.

WORKING WITH CHEFS TO SPOTLIGHT LOCAL PRODUCE

In response to concerns of certain food supplies being affected by lockdown restrictions around the world due to the COVID-19 pandemic, SFA took the opportunity to raise awareness of the role and importance of local produce. We collaborated with chefs Eric Neo, Jasper Jek, and KK Khong from the Singapore Chefs' Association (SCA) to create original recipes featuring local produce as a fresher, safe, and greener alternative to imported produce. The recipes were pushed out via the National Day Parade (NDP) 2020 e-booklet and website, SFA's Food for Thought microsite, and #fromSGtoSG microsite.

SFA also collaborated with YoRipe, a cooking and grocery mobile application, to feature local produce in its cooking competitions. These included the 'SG Cookathon 2020', which featured a 'live' virtual cook-along session hosted by social media influencer chef, Sulyn Tan, as well as the Junior Master Chef Finals where contestants had to feature local produce in their dishes.

Through virtual cooking demonstrations and competitions, as well as restaurant tie-ups featuring dishes prepared with local produce, we hope to endear and socialise consumers to our local farms and their produce, and encourage them to choose local produce. In doing so, we also hope to imbue the importance of sustainability and food supply resilience to the public. These were conducted as part of the month-long campaign, #ARecipeForChange, by Temasek Foundation's Ecosperity, a non-profit philanthropic organisation, which focused on the impact of our food choices on the environment.

LAUNCHING THE SG FRESH PRODUCE LOGO

To promote and help consumers better identify local



produce, SFA brought the industry and public together to co-create the SG Fresh Produce (SGFP) logo. This emblem was soft-launched in June 2020 and featured on online grocery apps – RedMart by Lazada, Cold Storage Online, FairPrice On, and Sheng Siong's allforyou.sg. We also partnered some of these supermarkets to develop and install local produce point-of-sale-materials (POS) featuring the SGFP logo in their physical stores. Subsequently, the SGFP logo was officially rolled out in August 2020 with 11 local farms adopting the logo on their packaging.

In addition, SFA collaborated with NDP 2020 to raise awareness of local produce through the event's collaterals. We sponsored 95,000 EZ-Link charms featuring the SGFP logo for inclusion in the NDP 2020 Fun Packs, which were distributed to teaching/non-teaching staff in schools, as well as front-line and essential workers.



PARTNERING SUPERMARKETS TO DRIVE CONSUMER PURCHASES

In FY 2020, SFA collaborated with various supermarkets to raise awareness of local produce and persuade consumers to buy local.

In January 2021, SFA partnered NTUC FairPrice to organise consumer promotions, refresh in-store branding materials, and ran newspaper advertisements to highlight local produce. We also worked with





SAYUR LEMAK WITH GRILLED PRAWNS

Sayur lemak is a dish that is available on my private dining dinner menu and is well-received by guests. The prawns...



GOATS MILK CREME BRÛLÉE

Infuse local goats milk and pair it with Cula Melaka syrup, combine with cherries with a granite of lemongrass and a...



IKAN CHUAN CHUAN

Ikan Chuan Chuan features a pan-fried fish served in a savoury piquant sauce of preserved bean paste & ginger.



ANG CHOW NANRU BARRAMUNDI DRY MEE SUA

This dish combines mee sua, blanched and done in a dry style with an angchow nanru sauce, with pan-seared...

NTUC FairPrice to set up an interactive game at its Parkway Parade hypermarket that encouraged patrons to visit various 'Made-in-Singapore' food sections to learn more about Singapore's food products and fresh produce.

SFA also worked with Cold Storage to roll out 'Buy Local, Eat Fresh' POSMs featuring the new SGFP logo in 40 outlets across Singapore in July 2020. In August 2020, in celebration of National Day, we encouraged consumer purchase of local produce through Cold Storage's online promotions. In addition, four videos were produced, in which local chefs – Annette Tan, Petrina Loh, Haikal Johari, and Damian D'Silva – demonstrated how to cook their signature dishes using local produce.

Together with Prime Supermarket, two 'Buy Local Produce' campaigns were rolled out, with a series of promotions featuring local producers. The campaign comprised newspaper advertisements and production of in-store POSMs featuring the new SGFP logo

displayed at all outlets. SFA also supported Prime in its new e-commerce platform where consumers could purchase homegrown food conveniently.

We also worked with Sheng Siong to produce POSMs of the SGFP logo which were placed in all of its outlets in Singapore. Sheng Siong also created a local produce category on its e-commerce store featuring the SGFP logo prominently on all local produce retailing in its stores.



Speakers at the webinar launch of the Clean and Green Standard in the Agriculture Technology Laboratory at Republic Polytechnic

PROVIDING ASSURANCE TO CONSUMERS THROUGH CERTIFICATIONS

On top of enhancing the branding of local produce through the SGFP logo, SFA also took steps to raise consumers' confidence and interest in local produce through additional quality assurance certifications attained by our local farms.

In FY 2020, SFA developed and launched a new "Singapore Standard 661 (SS 661): Specification for Clean and Green

Urban Farms – Agriculture", which provides guidelines on clean and green farming practices and methods to grow more with less. SS 661 will also enhance local farms' competitiveness by allowing them to differentiate and brand their produce in the markets. A webinar was organised in March 2021 to share the scope of technical requirements with over 200 participants from various food, testing, and inspection companies, as well as associations, agencies, training and research organisations, and consultancy companies.

As at the end of FY 2020, seven farms were certified for Good Agricultural Practices for Vegetable Farm (GAP-VF), and four were certified for Good Agricultural Practices for Fish Farming (GAP-FF). Three were certified under the Singapore Quality Egg Scheme (SQES). These schemes provide assurance to retailers and consumers by

setting benchmarks for the production of safe and good quality local produce.

RALLYING CITIZEN ADVOCATES TO PROMOTE LOCAL PRODUCE

From July to October 2020, SFA and the Ministry of Sustainability and the Environment (MSE) formed a Citizen's Workgroup to co-create solutions to increase the demand for local produce. Close to 400 citizens from different walks of life signed up to be part of the Workgroup, and 50 citizens from diverse backgrounds were selected.

Subject matter experts from public agencies and industry were invited to share their knowledge and insights with participants to enable them to develop robust and meaningful recommendations.

A total of six sessions were convened, with participants

gathering online over four sessions due to COVID-19, before moving to a hybrid of physical and virtual meetings when restrictions were eased. For the final two sessions, participants came together to prototype and presented six recommendations covering wide-ranging themes such as education and building awareness, product design, user experience, and demand aggregation.

MSE and SFA responded to the recommendations from the Citizens' Workgroup in February 2021. Of the six recommendations, two were selected to be piloted together with the Workgroup participants and industry, namely: (1) To develop a LoveSGMumsMeal campaign featuring local produce as new mothers' first meal after delivery; and (2) To promote local produce in wet markets with 'Made in SG' visual merchandising that allows shoppers to identify the source of the produce.



BRINGING FARMING INTO HOMES

Home-growing kits, which provide a scaled-down version of indoor plant-growing systems, serve as an educational tool for the public to understand more about food production, and how to reduce and recycle food waste. To encourage more households to engage in this activity, SFA and NParks jointly created a YouTube video to educate the public on how to choose or make a home-growing kit that promotes better vegetable growth, along with tips on how to address common issues such as small plant size and food waste composts that are too high in sodium salt.

In FY 2020, SFA also collaborated with NParks to incorporate messages on local produce into NParks' community gardening programmes and events. We highlighted SFA's food security messages in seed packets that were distributed free to house-

holds, as well as providing virtual talks and sponsoring hydroponic growing kits as part of NParks' Community Gardening Festival. In addition, SFA produced an online resource package for NParks' "Every Child A Seed" programme to educate students on the importance of food security.

CULTIVATING APPRECIATION FOR LOCAL PRODUCE IN YOUTHS

In FY 2020, we partnered the Singapore Science Centre (SCS) and Ministry of Defence (MINDEF) to raise awareness of local food production and resilience amongst youths in Singapore.

SFA worked with SCS on the National Science Challenge 2020, a television gameshow series where students competed in science challenges. We designed a challenge that showcased indoor farming technology as a resource-efficient and climate-resilient

method of food production adopted by the local agri-food industry to strengthen our food security. Contestants were tasked to find out about the issues faced by indoor farmers and present their solutions.

SFA also partnered NEXUS, MINDEF to feature food security as a topic in its annual, digital animation competition for youths, N.E.mation! 2021, to express their views on the five pillars of Total Defence through animation. SFA hosted students to a virtual immersion visit to the MAC, where participants learned about the importance of Singapore's food security and MAC's role in developing our local marine aquaculture sector.



BASKET 3: GROWING OVERSEAS

SFA supports Singapore companies in exporting urban food solutions to other countries, and in their efforts to expand and grow overseas. At the same time, this enables them to break into new and bigger markets.

Taken together with the local demand, our companies will enjoy greater economies of scale. All these will further contribute to Singapore's food security.

Together with MSE, SFA is working with the Ministry of Trade and Industry (MTI) to help local companies venture and expand overseas so that we can foster and build greater inter-dependencies with other countries

and form strategic partnerships. To date, our local farms have ventured into countries and regions such as Australia, Brunei, Hong Kong, Thailand, and China.



BALANCING REGULATION AND INNOVATION

Ensuring Safe Food For All



It is a delicate balance between ensuring food safety and expanding our import sources. Guided by risk management and science, we take a measured approach in our roles as regulator and facilitator.

ENSURING SAFE FOOD FOR ALL

With the diversity of our food sources and the emergence of new food and food technologies, ensuring food safety is of paramount importance.

MAINTAINING A ROBUST FOOD SAFETY SYSTEM

As Singapore's food safety authority, SFA is committed to ensuring and securing a supply of safe food for the nation. We adopt a risk-based approach to

food safety, which is guided by science and consistent with international standards. An integrated farm-to-fork food safety system is in place to ensure that food is safe for consumption. With food safety ultimately being a joint responsibility,

SFA fosters an enabling environment so that all stakeholders can each play their part.

SETTING NATIONAL STANDARDS

SFA constantly monitors international developments to

ensure that Singapore's regulatory requirements for food are aligned with global shifts and standards. In FY 2020, we continued to review and enhance existing standards to further strengthen food safety in Singapore.

Upholding the safety of ready-to-eat food

As ready-to-eat food are available for consumption without the need for cooking or any other form of processing, it is important to closely monitor the safety of such food. SFA conducted a review on the microbiological standards for ready-to-eat food to ensure existing food standards are aligned with international standards, and applicable to current food production, consumption patterns, and the local situation. We worked closely with industry stakeholders and foreign trading partners through several rounds of consultations. The revised standards came into force on 3 April 2020.

Staying ahead of developments in food regulations and safety standards

SFA made amendments to the Food Regulations to allow the use of new food additives to facilitate trade, ensure existing regulations are in line with international standards, as well as to meet the changing needs of the industry while safeguarding food safety. These included the incorporation of a provision to allow new food additives, such as *soy leghemoglobin* derived from genetically modified *Pichia pastoris*, *ferrous bisglycinate* and *lutein esters* from *Tagetes erecta*.

Safeguarding consumer health through maximum residue limits for contaminants

SFA reviewed the maximum residue limits (MRLs) in the Food Regulations for contaminants such as pesticide residues, toxins, and heavy metals. New MRLs were also established for veterinary drug residues to further safeguard consumer health and meet the changing needs of the food industry. The standards are in line with international standards including those set by the Codex Alimentarius Commission and major developed countries.

Ensuring the safety of novel food

Alternative proteins refer to proteins that do not come from animals. Some alternative proteins, such as plant-based mock meat products made of soy or wheat proteins, have long been a traditional feature in our diets.

However, there are other forms of alternative proteins that do not have a history of being consumed as food – including cultured or cell-based meat grown under controlled conditions, and certain species of algae and fungi (mycoprotein). These are deemed novel food.

Food safety must be the principal consideration when companies develop food products, novel or otherwise. To ensure the safety of novel food, SFA has developed a novel food regulatory framework, which requires novel food products to be put through a pre-market safety assessment before they are allowed for sale. Companies must cover the potential food safety risks, including toxicity,

allergenicity, and safety of its production method. They must also provide detailed information on the materials used in its manufacturing processes and how these processes are controlled to prevent food safety risks.

SFA also established a Novel Food Safety Expert Working Group, comprising experts in relevant fields such as food toxicology, bioinformatics, nutrition, epidemiology, public health policy, and food science and technology, to provide scientific advice.

An example of a novel food product that has gone through SFA's rigorous regulatory framework is Eat Just, Inc.'s cultured chicken. In December 2020, SFA became the first food safety authority in the world to allow Eat Just, Inc.'s cultured chicken to be used as an ingredient in its nugget product following scientific assessment and food safety laboratory tests. SFA and the expert working group had reviewed the data provided and found it to be safe for consumption at the intended levels of use. SFA will continue to keep abreast of the latest developments and emerging scientific data to ensure the safety of novel food.

REGULATING FOOD IMPORTS

With Singapore importing more than 90 percent of our food, it is important to regulate our food imports to ensure that they are safe for consumption.

Accrediting food sources

To ensure a supply of food imports that meet Singapore's food safety and animal health require-



ments, SFA requires accreditation at source for higher-risk food products (such as meat and eggs) imported into Singapore. Our source accreditation programme assesses imported food on two levels to ensure imports meet our food safety and animal health requirements.

At the “country” level, the robustness of the country’s national food safety and animal health systems are evaluated, while at the “farm/establishment” level, factors including biosecurity measures, farm management, food safety management system (FSMS),

and good manufacturing practices are verified. In the event of a breach in food safety or animal health standards in the approved country or farm/establishment, SFA will take enforcement action, such as suspension of import.

Minimising impact to supply in event of disease outbreaks

Given our high reliance on imports, it is important to minimise disruptions to our food supply in the event of animal disease outbreaks overseas. We do so by establishing regionalisation arrangements with approved countries/re-

gions. By separating affected areas from disease-free ones, regionalisation allows us to recognise an area of a country as disease-free, and to continue trade with such areas even if the animal health status of the rest of the country is not favourable.

In FY 2020, we established 13 regionalisation arrangements, to minimise the impact to our food supply should any animal disease outbreak occur.

Regulating importers

Food importers need to be licensed/registered. Each con-

NEW ACCREDITATION OF SOURCES OF MEAT, EGGS, AND LIVESTOCK (LIVE POULTRY) (FY 2020)



40
Countries approved



145
Establishments accredited

60
Farms accredited

2
Farms reinstated

2
Farms suspended

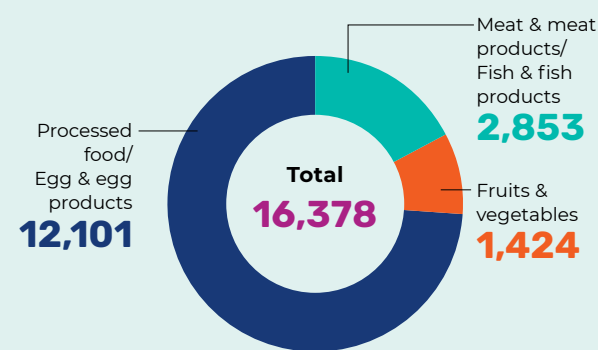
0*
Farms and establishments inspected

* No farms and establishments were inspected due to COVID-19 travel restrictions.

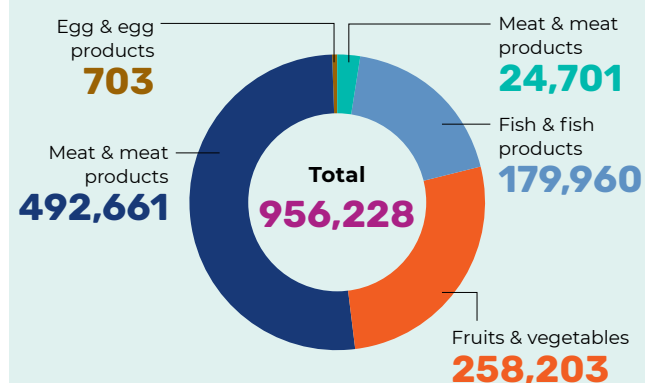


LICENSING AND REGISTRATION OF IMPORTERS (FY 2020)

Licences / registrations



Import permits



signment of food must be declared and accompanied by valid import permit(s). This ensures accountability and food traceability, and facilitates food recalls if infringements are found. In FY 2020, we issued 956,228 import permits to 16,378 licenced or registered importers.

Ensuring the food safety standards of imported eggs

SFA only allows the import of eggs from SFA-accredited farms to ensure the food safety standards of imported eggs. As part of our surveillance and inspection programme, we monitor and sample imported eggs for testing to ensure that they

meet our food safety requirements, and do not contain Salmonella Enteritidis (SE). SE is a bacterial pathogen that can cause potential foodborne illness if the infected food is consumed raw or is undercooked. SE may be found in eggs if the source farm’s birds are infected with the bacteria.

INSPECTION, SAMPLING, LABORATORY TESTS, COMPLIANCE RATES (FY 2020)

Food Type	Volume inspected* (tonnes)	Value inspected* (million)	Consignments inspected	Samples collected	Lab test pass rate (%)
Meat & meat products	48,977	258.8	18,790	9,878	98.57
Seafood products	3,431	68.27	3,432	1,964	98.07
Fruits & vegetables	3,709	7.09	14,135	13,249	87.30
Processed food	8,705	24.4	3,902	2,867	94.18
Processed eggs	5,125	20.2	1,105	1,053	98.48
Chicken and quail eggs	2,374,060^	26.04	1,500	1,333	98.72

* rounded up figures
^ unit is CEN, in hundreds

In FY 2020, we reviewed our approach for handling imported eggs from farms suspended due to SE detection in eggs. If imported eggs are detected with SE, we will issue an immediate suspension of the source farm to prevent further imports into Singapore. SFA may also recall the eggs from the implicated farm if necessary.

Facilitating import of safe meat

To facilitate trade, SFA reviewed and removed the requirement on the timeframe in which meat and meat products must be imported, from time of slaughter for meat or time of manufacture for meat products. When stored well and consistently at deep-frozen temperature, meat and meat products remain safe for



consumption. This provides importers with greater flexibility and choice of sources to import meat and meat products.

CLAMPING DOWN ON ILLEGAL FOOD IMPORTS

SFA requires all food imports to meet food safety requirements

to safeguard public health. Illegally imported food products of unknown sources can pose food safety risks, and offenders who illegally import meat and fish products are liable, on conviction, to a maximum fine of \$50,000 and/or imprisonment for a term not exceeding two

years. In FY 2020, SFA prosecuted two cases of illegal food imports detected in FY 2020 and issued 127 warnings and 65 composition fines to illegal importers.

KEEPING WATCH OVER LOCAL FARMS AND FOOD ESTABLISHMENTS

SFA licenses all farms and food establishments in Singapore, including slaughterhouses, food processing/manufacturing establishments, food retail establishments, and cold stores. SFA also regulates food storage warehouses in Singapore.

Licensing & registration of local farms & establishments (FY 2020)

Type of establishment	No. of licences	No. of registrations
Farm	247	-
Processing / manufacturing	1,450	-
Slaughterhouses (poultry, pig, frog, turtle & crocodile)	18	-
Central kitchen	284	-
Cold store	188	-
Retail	49,815	-
Warehouse	-	1,284

ILLEGAL IMPORTS (DETECTED IN FY 2020)						
	Total	Meat & meat products	Fish & fish products	Egg & egg products	Fruits & vegetables	Processed food
PROSECUTION	2 cases 0.333 tonnes involved	1 case 0.153 tonnes involved	0 cases 0 tonnes involved	0 cases 0 tonnes involved	1 case 0.18 tonnes involved	0 cases 0 tonnes involved
COMPOUND FINES	65 cases 66.756 tonnes involved	30 cases 0.753 tonnes involved	0 cases 0 tonnes involved	7 cases 53.32 tonnes involved	13 cases 4.852 tonnes involved	15 cases 7.831 tonnes involved
WARNINGS	127 cases 45.082 tonnes involved	9 cases 0.171 tonnes involved	0 cases 0 tonnes involved	1 cases 0.011 tonnes involved	12 case 7.742 tonnes involved	105 cases 37.158 tonnes involved

**Local farms & processing / manufacturing establishments:
Overall inspection, sampling, laboratory tests and compliance rates (FY 2020)**

Type of establishment	Quantity	Inspection visits conducted	Inspections detected with non-compliance	Samples collected	Lab test pass %
Farm	247	3,297	3	901	98.00
Slaughterhouse	18	1,222	39	10,924	98.13
Processing / manufacturing	1,450	5,035	176	2	100
Total	1,715	9,554	218	11,827	

**Local retail establishments & central kitchens:
Overall inspection, sampling, laboratory tests and compliance rates (FY 2020)**

Type of establishment	Quantity	Inspection visits conducted	Inspections detected with non-compliance	Samples collected	Lab test pass %
Central kitchen	284	852	48	0	0
Retail	49,815	54,311	2,224	267	92.13
Total	50,099	55,163	2,272	267	

SMALL-SCALE FARMS AND GARDENS

In response to the growing interest from small-scale farms and gardens to sell their produce, and to further facilitate such non-commercial crop cultivation activities, SFA approves the sale of produce from these activities using a risk-based approach. Small-scale farms and gardens, which typically occupy spaces in retail outlets, housing estates, educational institutions, and hospitals, are exempted from licensing re-

quirements if they meet the following criteria:

- Monthly production volume of less than 200 kg/month
- No use of pesticide
- No use of human excreta, or raw animal or bird excreta as manure during the cultivation process

SLAUGHTERHOUSES

SFA inspects imported live-stock as part of our efforts to prevent the introduction of

animal-borne diseases and to ensure that the meat is safe for consumption. Samples of meat and meat products are tested for foodborne pathogens, zoonotic diseases, and drug residues. In addition, SFA inspectors conduct regular checks at slaughterhouses to ensure that they comply with the conditions of licensing and cold-chain requirements, and that good slaughtering and meat hygiene practices are in place.



In FY 2020, we conducted 1,222 inspections at 18 local slaughterhouses. In total, 10,924 samples were collected to test for foodborne pathogens and chemical contaminants such as drug residues.

COLD STORES AND FOOD STORAGE WAREHOUSES

Cold stores used for storage of meat and fish/seafood products are required to be licensed by SFA. Other food storage warehouses are encouraged to be registered with SFA to ensure traceability of food products in the supply chain. Food products stored at food storage warehouses need to comply with our food safety requirements. As at the end of FY 2020, there were 188 licensed cold stores and 1,284 registered warehouses.

FOOD ESTABLISHMENTS

SFA conducts routine inspections for food establishments. As at the end of FY 2020, SFA licensed 49,815 food retail establishments including food caterers, coffeeshops, food courts, hawker and market stalls, canteens, restaurants, snack bars, cafes, supermarkets, and mobile food wagons. Licensees are required to en-

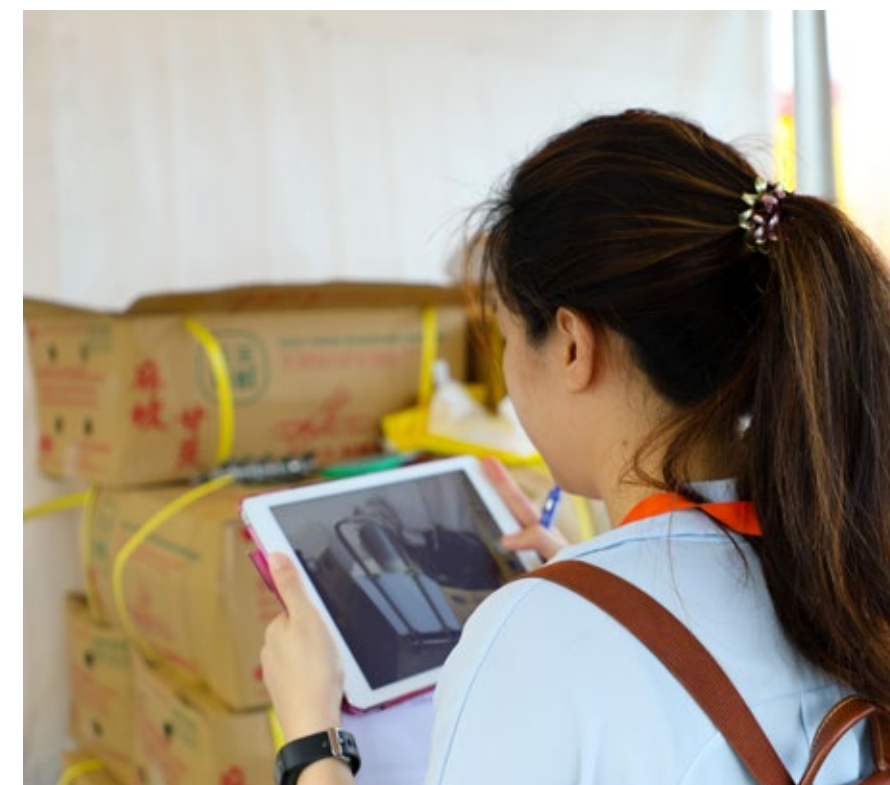
sure the proper upkeep of their premises. All food handlers involved in the preparation and handling of food are also required to pass the first level of the Food Safety Course and be registered with SFA. There were also 1,752 non-retail establishments, including manufacturers, slaughterhouses, and central kitchens, licensed by SFA at the end of FY 2020.

SFA also conducts annual audit assessments on local food processing and manufacturing establishments. Areas of audit include pest control, food handling and storage, traceability, staff competency, and documentation or record-keeping. Our officers also provide on-site advice to help establishments improve their practices and upgrade their premises. In FY 2020, 5,035 routine inspections were conducted on 1,450 processing and manufacturing establishments.

DEVELOPING NEW LICENSING APPROACHES FOR SHARED TEST-BEDDING FACILITIES

Shared food processing facilities allow start-ups and existing manufacturers to test bed and commercialise new food products in small trial batches for the consumer market on a pay-per-use basis. With multiple companies using the facilities at the same time, the operating model of shared food processing facilities offers greater economies of scale as compared to that of a regular establishment. This operation model is significantly different from regular food processing establishments as multiple companies will be using the facility at the same time.

In FY 2020, SFA approved plans for a shared food processing facility at JTC Food Hub @ Senoko. A risk-based approach was adopted to encourage food innovation without compromis-



ing food safety. To mitigate the risk arising from the sharing of equipment or rooms, such as criss-crossing of incompatible process flows, SFA licenses the overall operator of the facility, who will be responsible for overseeing all operations in the premises. As the operator of the facility at JTC Food Hub @ Senoko, the Singapore Institute of Technology (SIT) is required to ensure that all users undergo a structured training programme prior to using the shared equipment and submit a food safety risk assessment plan. Users are also required to maintain retention samples for traceability purposes.

CLAMPING DOWN ON ILLEGAL HAWKING

Illegal hawking poses risks to food safety due to the poor hygiene, handling, and storage practices of unlicensed hawkers. Furthermore, the unknown distribution network of the food sold by illegal hawkers impedes the traceability of food sources in the event of a gastroenteritis outbreak or food recall exercise.

In FY 2020, we issued 220 warnings and 68 composition fines, while 154 cases were prosecut-

ed in court for illegal hawking activities.

In June 2020, SFA adopted a new approach to improve the surveillance of unlicensed hawkers by leveraging technology. This replaces SFA's previous approach of deploying officers to conduct surveillance at illegal hawking hotspots island-wide or to respond to feedback on illegal hawking, which was manpower-intensive. With the new approach, enforcement will be complemented with technological capabilities. SFA will focus on using data analytics to identify hotspots, predict movements, and optimise resources and deployment, while ground surveillance and enforcement work will be outsourced to contracted vendors.

MANAGING FOOD SAFETY INCIDENTS

With food going through a long and often complex supply chain, there is always a risk of food safety incidents occurring anywhere along this chain. These can be caused by microbiological (e.g. Salmonella), chemical (e.g. pesticides residues, drug residues, toxins, additives and heavy metals),

physical (e.g. glass or metal pieces), or allergenic (e.g. nuts) hazards. To manage food safety incidents effectively, SFA puts in place processes to enable us to respond and intervene in a timely manner. These processes include investigation, laboratory testing, as well as the legislative power to swiftly effect food recalls where needed.

INVESTIGATING GASTROENTERITIS INCIDENTS

SFA investigates gastroenteritis cases and suspected food safety lapses that occur in food premises. Where warranted, we work with the Ministry of Health (MOH), National Environment Agency (NEA), and the Public Utility Board (PUB) to conduct joint investigations for gastroenteritis incidents. During these joint investigations, SFA performs checks on food safety and hygiene of the premises, as well as checks on the registration of food handlers. We also collect food samples and conduct swabs on food contact surfaces for testing. In FY 2020, SFA was involved in 29 joint investigations in SFA-licensed premises, including restaurants and caterers, as well as in non-SFA-licensed premises such as pre-schools.

Major gastroenteritis incidents (FY 2020)

Foodborne causes	9
Non-foodborne causes (Likely person-to-person transmission/via contaminated surfaces)	4
Inconclusive	0
Total	29



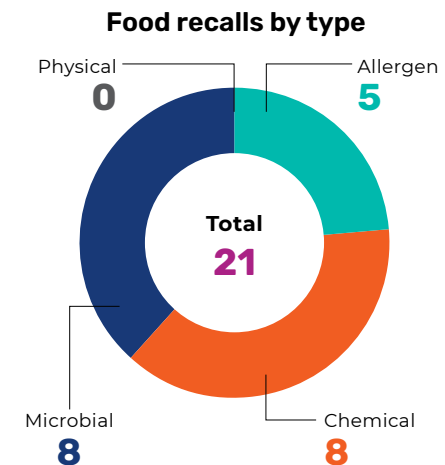
PREVENTING GASTROENTERITIS INCIDENTS

There was a significant drop in the number of gastroenteritis incidents reported to SFA in FY 2020. This was likely due to the COVID-19 measures implemented in Singapore, such as during the Circuit Breaker period when large-scale gatherings and dining at food establishments were not allowed.

Nevertheless, we continued to work closely with the Ministry of Education (MOE) and Early Childhood Development Agency (ECDA) to remind pre-school operators about the importance of maintaining high standards of food safety and hygiene. This is in light of the several gastroenteritis incidents in pre-schools in late 2020 and early 2021. In FY 2020, we worked with MOE to incorporate guidelines on good food safety and environmental hygiene practices at schools. We also partnered ECDA to disseminate posters providing guidance on good food safety and environmental hygiene practices.

RECALLING UNSAFE FOOD

Working with food establishments, relevant agencies, and overseas government authorities, SFA swiftly effects food recalls when contamination in food is suspected. This ensures that the public is not subjected to unnecessary food safety risks. We also advise on measures to prevent recurrence of such incidents. In FY 2020, a total of 21 recalls were conducted due to the presence of allergen, chemical, microbial, and physical contaminations.



Footnote

Allergen - Undeclared allergens such as milk, egg, peanut, and almond

Chemical - Pesticides and unauthorised additives

Microbial - Bacteria (e.g. E.coli, Listeria) and viruses (e.g. norovirus)

Physical - Foreign matter

STRENGTHENING THE FOOD SAFETY SYSTEM

From exporters to food retail establishments and workers, the food industry plays a major role in Singapore's food supply chain. To ensure food safety, all players have a part to play, be it maintaining high standards of cleanliness and public hygiene at food retail establishments, or ensuring that workers are trained in food safety and hygiene practices.

STRENGTHENING INDUSTRY COMPETENCY IN FOOD SAFETY

A competent and trained workforce is crucial in ensuring the adoption of systems and processes for better food safety assurance by the food industry. In FY 2020, SFA further enhanced our competency and training framework into a four-tiered training programme to upskill and equip the food industry workforce in food safety and hygiene practices.

Food Safety Course Level 1

The Basic Food Hygiene Course (BHFC), which covered topics including personal hygiene and proper food handling and storage, was revised and rolled out as Food Safety Course Level 1 in end-2020. The revised curriculum retains the key food safety principles from the Basic Food Hygiene Course, and incorporates relevant examples and illustrations for retail and non-retail food establishments, to allow trainees to better relate to their actual work environment.

Food Safety Course Level 2

SFA also developed the curriculum for Food Safety Course Level 2, to upskill food handlers in their food safety knowledge and skills. This is targeted to launch in the later part of FY 2021.

The course will deepen the food handlers' understanding of the rationale behind for key food safety concepts as well as the approach to conduct basic checks to identify food safety lapses. It will also recommend simple corrective actions.

Food Safety Course Level 3

Licensees of food retail businesses that are involved in large-scale food preparation and with multiple food stalls are currently required to appoint a Food Hygiene Officer (FHO) to reinforce hygiene and sanitation standards in the licensed premises. The appointed staff must pass the 'Conduct Food & Beverage Hygiene Audit Course' to qualify as an FHO. In FY 2020, SFA reviewed this course curriculum

together with IHLs and will be revising the course as the Food Safety Course Level 3, to be implemented in FY 2021.

Food Safety Course Level 4

SFA also worked with IHLs to develop the Food Safety Course Level 4, to upgrade and upskill the competencies of FHOs to enable them to progress to Advanced FHOs. The Advanced FHOs will be able to develop and implement Hazard Analysis and Critical Control Points (HACCP)-based food safety management system to minimise food safety risks at their food establishments. They will also be trained to conduct internal audits on the implemented FSMS.

ENCOURAGING JOINT RESPONSIBILITY IN FOOD SAFETY AMONG EXPORTERS

To encourage joint responsibility in food safety, SFA rolled out a revised export certification programme for food products in April 2020. The revised programme requires exporters to have FSMS and traceability and recall processes in place, and appoint a Qualified Person (QP) to oversee the monitoring process of the export consignments. This includes ensuring that the exporting company and food products intended

for export are approved by the importing country, and that the food products meet the requirements of the importing country. Exporters are also required to submit samples of the food products to private laboratories accredited under SFA's Laboratory Recognition Programme for testing, if required by the importing country.

SFA conducts engagement and training sessions to familiarise exporters and their QPs with the revised process. Our officers also conduct audits to ensure that the necessary processes and food safety systems are properly implemented and compliant with our food safety requirements.

AUDITING FOOD RETAIL ESTABLISHMENTS FOR 'SG CLEAN' QUALITY MARK

The 'SG Clean' campaign was rolled out in February 2020 by NEA, together with SFA, the Enterprise Singapore (ESG), ECDA, MOE, Singapore Tourism Board, and Ministry of Transport, to raise standards of cleanliness and public hygiene in Singapore. In FY 2020, SFA conducted audits of hawker and market stalls, coffeeshops, and canteens under the 'SG Clean' campaign. At the end

of FY 2020, 9,506 hawker and market stalls, 6,705 coffeeshop stalls, and 743 canteens received the 'SG Clean' quality mark. A total of 3,385 hawker and market stalls, coffeeshop stalls, and canteens were also recertified.

STREAMLINING APPLICATION PROCESSES FOR LICENSEES

Besides our regulatory role in ensuring food safety in Singapore, SFA also constantly explores ways to enhance our work processes to better serve our licensees. In FY 2020, the refinements implemented to some of our workflows and requirements resulted in smoother licensing and approval processes.

IMPROVING FOOD LICENCE APPLICATION WORKFLOWS

From January 2021, SFA improved the workflow for licence applications for food retail establishments (food shops, food stalls, and supermarkets). SFA would now only process applications that are complete with the layout of the premises for us to assess whether the setup meets our food safety requirements. Applicants whose applications do not include a layout of the premises would be required to re-submit an application with the layout. Prior to this new workflow, there were many instances of applicants submitting licence applications that did not include proper layout plans, resulting in loss of productivity, with officers having to follow up with the applicants repeatedly.

With this new workflow, officers could focus on processing

only complete licence applications. At the same time, applicants would be able to receive the In-Principle Approval (IPA) sooner. This allowed them to commence the renovation of their premises faster. The improved workflow also placed emphasis on the applicants' responsibility in the process so that the licence can be issued efficiently.

STREAMLINING APPLICATIONS FOR TEMPORARY FAIR PERMITS

In FY 2020, SFA revised and streamlined the requirements to make it more convenient and efficient for temporary fair permits to be issued. Operators that comply with SFA's food safety requirements and have obtained approval from the landowner and grassroots advisor will receive a temporary fair permit. While approval from other agencies may still be required, applicants need not submit the approval to SFA, streamlining the permit application process for operators.

REVISING REGISTRATION REQUIREMENTS FOR FISHERMEN

As part of SFA's ongoing efforts to streamline and reduce regulatory costs for the fishing industry, we revised the renewal requirements for the licence to operate an inshore vessel, as well as the licence for fishing gear. Since March 2021, applicants only need to submit a one-time registration for a licence for an inshore vessel or licence for fishing gear, without the need for annual renewal if there are no changes.



MONITORING AND TESTING FOR FOOD SAFETY

SFA's National Centre for Food Science (NCFS) is the national reference laboratory on food science. It plays a crucial role in the enforcement of Singapore's food safety regulations and conducts food safety monitoring to generate scientific data for risk assessment and food safety standard review. The application of science and technology enables us to adopt an evidence-based approach in addressing emerging food safety and security concerns.

NCFS also plays a regional and international role as the World Organisation for Animal Health (OIE) Collaborating Centre for Food Safety, the World Health Organization (WHO) Collaborating Centre for Food Contamination Monitoring, and the Association of Southeast Asian Nations (ASEAN) Food Reference Laboratories in multiple food safety testing areas. We provide our expertise in various capacity-building programmes that strengthen the technical competency of local, regional,

and international food testing laboratories.

To improve our operational efficiency and capabilities, a new NCFS facility will be set up at the International Business Park to bring these laboratories under one roof in FY 2021.

ENHANCING TESTING AND DIAGNOSTIC CAPABILITIES

NCFS provides scientific expertise in food safety by performing in-depth applied research, risk assessment studies, data analytics, and laboratory diagnosis. In FY 2020, 250,177 laboratory tests on 50,925 samples of food were conducted at NCFS. The laboratory also continued to provide testing services to support the investigation of foodborne disease outbreaks.

NCFS is committed to maintaining high laboratory testing standards in Singapore. As at the end of FY 2020, NCFS has attained accreditation for a total of 332 tests, including 19 new ones accredited in FY 2020.

The 'SG Clean' campaign was rolled out in February 2020 by NEA, together with SFA, the Enterprise Singapore (ESG), ECDA, MOE, Singapore Tourism Board, and Ministry of Transport, to raise standards of cleanliness and public hygiene in Singapore.

New tests accredited in FY 2020:

Chemical:

Amphenicols, Beta-agonist, Penicillins, Fluoroquinolones, Macrolides, Nitroimidazoles & metabolites, Quinolones, Sulfa drugs, Coccidiostats in Egg by LC-MS/MS

Amphenicols, Penicillins, Fluoroquinolones, Macrolides, Nitroimidazoles & metabolites, Quinolones, Sulfa drugs, Coccidiostats in Honey by LC-MS/MS

Glyphosate, AMPA, Glufosinate and Ethephon in Oil Seeds and Products by LC-MS/MS

Cereulide (Emetic Toxin) in Food by LC-MS/MS

Determination of Egg Allergen in Food by ELISA

Identification of Fish Species by NGS

Identification of Meat Species by NGS

Identification of Meat Species by Real-Time PCR

Net Content of Frozen Seafood

Polychlorinated Dibenzodioxins (PCDDs), Polychlorinated Dibenzofurans (PCDFs) & Polychlorinated Biphenyls in Food by GC-MS/MS

Rhodamine B in Food by LC-MS/MS

Biological:

Aerobic/ Heterotrophic / Total Plate Count in Drinking Water

Aerobic/ Total Plate Count, E.coli count, Coliform count, Enterobacteriaceae count in All Food Products by Real-time Colony Counting System

Coliform Count in Drinking Water

Enterococci Count in Drinking Water

Escherichia Coli Count in Drinking Water

Pseudomonas Aeruginosa Count in Drinking Water

Serotyping of Salmonella isolates in all Food Products by Slide agglutination

Sulfite-reducing Anaerobes (Clostridia) Spores in Drinking Water

NCFS participates in a wide range of international proficiency testing (PT) programmes annually to benchmark our testing capabilities with other international peer laboratories. The PT programmes are organised by internationally reputable PT scheme providers, such as those from the United Kingdom, United States, European Union, Australia, New Zealand, and the Netherlands.

These programmes cover a wide spectrum of analytes in different samples matrices, such as pathogens and food-borne viruses, residues of veterinary drugs and pesticides, and chemical contaminants.

In FY 2020, NCFS performed well in 92 proficiency test rounds under 19 categories of PT schemes administered by reputable international, regional, and local PT scheme providers.

NCFS remains committed to the continual development and improvement of our testing capabilities. Such improvements help us keep pace with newly emerging chemical and microbiological hazards that may

be present in food. In FY 2020, we developed five additional methods to establish new testing capabilities. In addition, 16 key enhancements were made to existing methods to improve accuracy and turnaround time.

New capabilities developed by NCFS:

- Detection of African Swine Fever virus in pork and pork products
- Detection of crustacean allergen by ELISA
- Detection of nitrosamines in dry seafood and products
- Detection of Salmonella spp in environmental swabs from poultry farm
- Detection of SARS-CoV-2 virus on food packaging and food surfaces

BOOSTING LABORATORY PRODUCTIVITY THROUGH AUTOMATION

NCFS leverages technology to improve testing productivity. The Food Microbiology Team procured a robotic system, Scanstation, to automate its processes and boost the labo-

ratory productivity for microbiological testing. The laboratory has since implemented four types of routine sample testing in December 2020 after the automated processes were accredited by the Singapore Laboratory Accreditation Scheme (SAC SINGLAS).

DEVELOPING LABORATORY CAPABILITIES

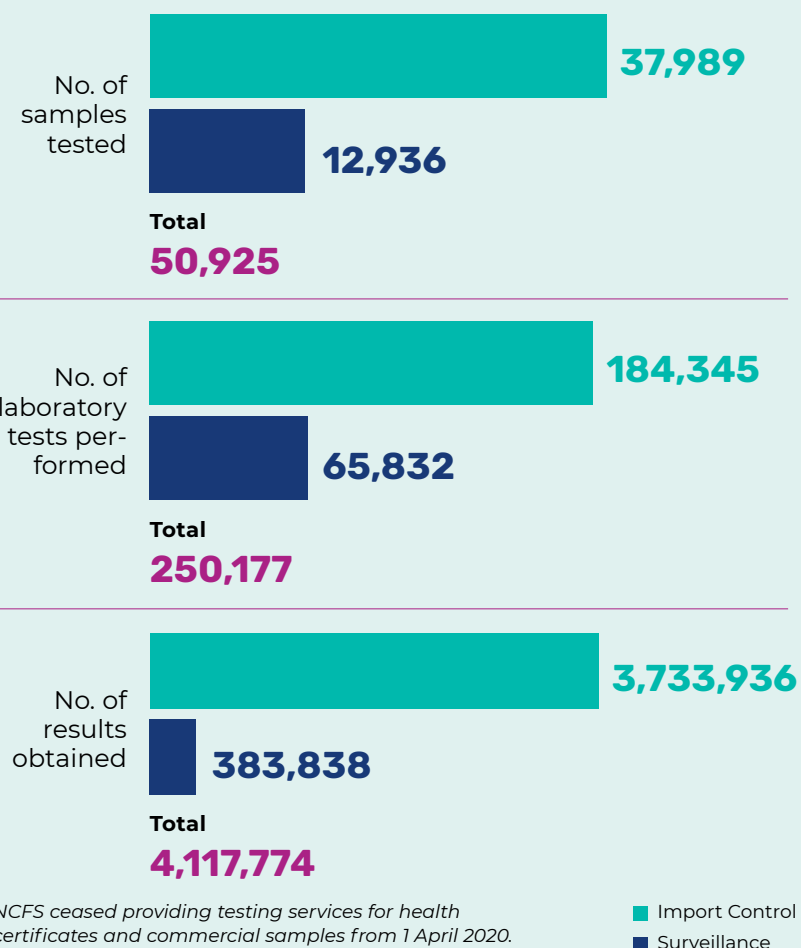
NCFS continually enhances its laboratory capabilities to detect threats of emerging hazards. In FY 2020, we established in-house whole genome sequencing and bioinformatics capabilities for Group B *Streptococcus* and *Salmonella Enterica* to support foodborne outbreak investigations.

NCFS further enhanced its technical capabilities in the detection and characterisation of nanoparticles in food and food-contact articles using Asymmetric Flow Field-Flow Fractionation hyphenated with Multi-Angle Light Scattering Detector and Inductively Coupled Plasma Mass Spectrometry.

For other emerging hazards like microplastics, NCFS developed a multi-technique-based analytical method for the detection and characterisation of microplastic in food and water. The methodology performed well in an inter-laboratory comparison study on microplastics in water organised by the European Commission Joint Research Centre. We also expanded our scope of microplastic analysis, with the procurement of instrumentation such as the Pyrolysis-GC/MS.



VOLUME OF TESTS CONDUCTED AT NCFS (FY 2020)



STRENGTHENING FOOD SAFETY THROUGH RISK ASSESSMENT AND DATA ANALYTICS

To further enhance and complement our food safety efforts, NCFS continued to expand and introduce initiatives that leverage emerging risk analysis and data science in FY 2020.

NCFS runs a market monitoring programme to identify retail products for regulatory inspection and sampling, with the aim to complement sampling efforts across the food chain. In July 2020, NCFS revised this programme to use

emerging risk analysis science to identify high-risk products in the market for targeted checks. The food sampling activities are then outsourced to industrial partners, an initiative which streamlined SFA's operation and allowed us to develop the industry's capabilities in supporting SFA during surges in food sampling needs. In addition, scientific data generated by the programme are used to establish a baseline prevalence of food safety hazards for risk assessment.

NCFS also pioneered a risk and data science framework – Food Safety Insights Through

Data Transformation (FIND) – to translate relevant data into food safety insights through interdisciplinary science and analytics. The framework was used to drive several key outcomes in FY 2020, including managing food poisoning outbreaks, and guiding targeted enforcement for improving the “hit rate” for detecting hygiene violation.

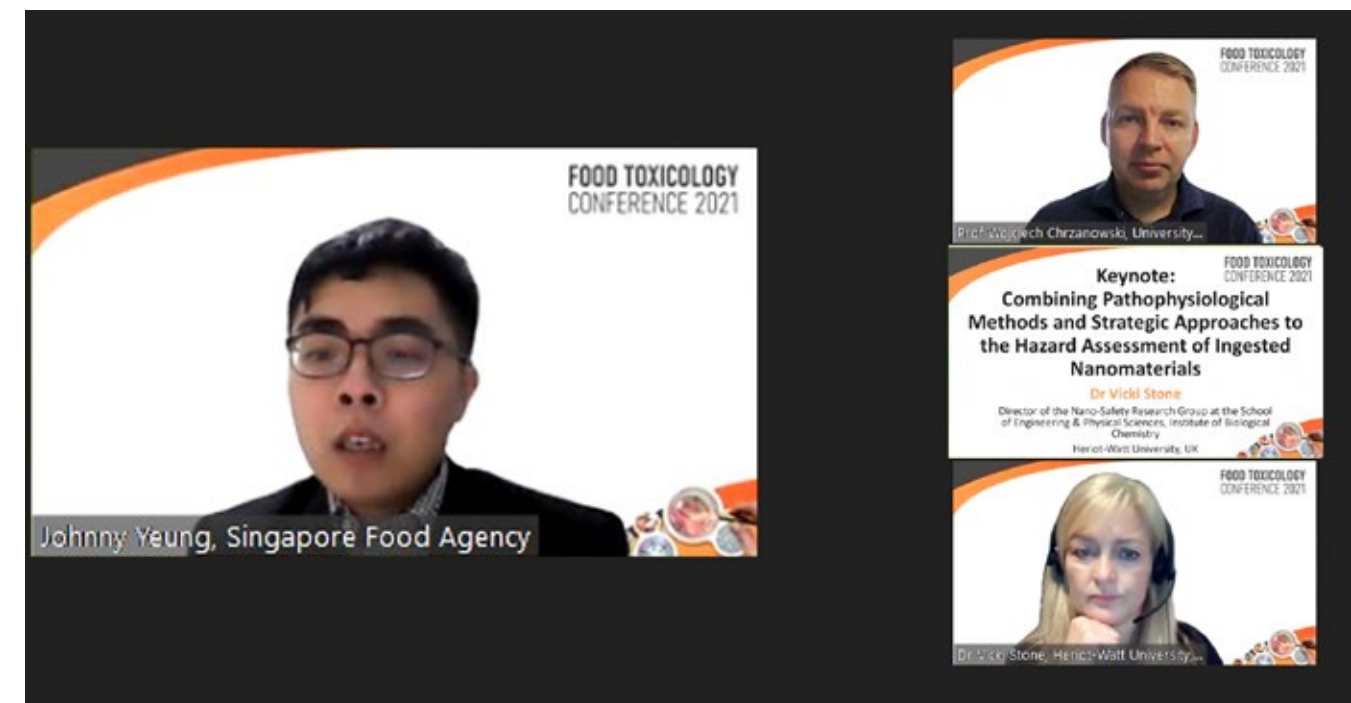
Under the FIND framework, NCFS also regularly shared scientific findings with industrial stakeholders and published 14 articles on our SFA website and six peer-reviewed articles to enhance food safety literacy and support the strengthening of Singapore's food safety system.

COLLABORATING WITH LOCAL AND INTERNATIONAL EXPERTS

NCFS partners various research institutes, IHLs, and overseas food safety organisations in food safety-related research. Some research collaborations that we embarked on in FY 2020 included the following:

- Development of real-time nanopore sequencing analytics for detection and characterisation of *Salmonella* spp. in eggs (with A*STAR)
- Quantitative antimicrobial susceptibility testing and genotypic characterisation of *Aeromonas* pathogens (with the University of Malaya)

NCFS continued to collaborate with international and local experts in enhancing laboratory testing capabilities in the region despite safe distancing measures and travel restric-



tions due to the COVID-19 pandemic. In FY 2020, we organised and participated in events such as the virtual Food Toxicology Conference 2021 to exchange ideas and knowledge on nanomaterials and nanotoxicity, and the Food Risk Communication Webinar, where SFA shared our science-based risk communication strategy.

NCFS also provides technical support such as hands-on training, interlaboratory testing, and sharing of expertise and experience to help laboratories expand their testing capabilities and verify their competencies. In FY 2020, NCFS assisted five local laboratories in developing and expanding their recognised testing scope in the areas of drugs residues, pesticides residues, organic and inorganic contaminants, pathogens, and parasites in food.

Training and Technical Sessions conducted by NCFS (FY 2020)

- On-site training for veterinary drugs residues testing (April 2020)
- Technical sharing for seafood parasites (September 2020)
- Technical sharing for:
 - (1) isolation of *Salmonella* from poultry farms
 - (2) serotyping of *Salmonella* spp.
 - (3) *Vibrio Parahaemolyticus* count in seafood (November 2020)

Interlaboratory Testing that NCFS participated in (FY 2020)

- Histamine in tuna (April/May 2020)
- Screening of Sulpha drugs in luncheon meat (September 2020)
- Detection of parasites in fish (September 2020)
- Organochlorine pesticides in chicken meat (October 2020)
- Cadmium in seaweed (November 2020)
- Eicosadienoic acid (C20:2) in evaporated milk (December 2020)
- Detection of SARS-CoV-2 in swabs (December 2020)
- Detection of Group B *Streptococcus* in chilled fish (March 2021)

Building regional food safety capacity

On top of laboratory training, NCFS actively contributes towards regional capacity building in risk and data science.

In FY 2020, NCFS was invited by the Food and Agriculture Organization of the United Nations (FAO) and Nanyang Polytechnic to share Singapore's approach of leveraging risk and data science to enhance the national food safety and quality management system. This sharing with Bhutan, Cambodia, and Vietnam was done as part of a series of programmes under the Initiative for ASEAN Integration by the Singapore Coordination Programme.

In collaboration with NParks and the ASEAN secretariat, and with technical assistance from the FAO, NCFS prepared a guideline for ASEAN on the risk analysis of antimicrobial resistance (AMR) in aquaculture. We also worked together to organise an introductory training course on risk analysis in February 2021. The efforts were aimed at enhancing the capacity and competency of aquatic animal health authorities in combatting AMR.

In addition, NCFS contributed to the development of the ASEAN Guideline on Techniques for Veterinary Drug Residue Detection in Aquaculture Products, ASEAN Guideline for the Prudent Use of Antimicrobials in Aquaculture, and Plan of Action for the ASEAN Cooperation in Combatting AMR in Aquaculture Sector (2021–2025).

Singapore was invited by the FAO Regional Office for Asia and the Pacific to develop and pilot an FAO tool to assess the capacities of various countries in antimicrobial residue monitoring. We also shared Singapore's experiences with the tool at the FAO Webinar in October 2020.

In addition, three ASEAN proficiency testing programmes were organised by NCFS:

- Aflatoxin B1 in maize flour
- Benzo(a)pyrene in olive oil
- Pesticide residues in French bean

PROMOTING JOINT RESPONSIBILITY IN FOOD SAFETY

Food safety is a joint responsibility. While SFA puts in place a regulatory system and enabling environment to ensure food safety, the food industry and consumers each have crucial roles to play as well. The food industry must maintain good food safety standards and be responsible for the safety of the food they offer to consumers, while consumers can do their part by adhering to good food safety and hygiene practices, as well as making informed decisions.

Food safety is a joint responsibility. While SFA puts in place a regulatory system and enabling environment to ensure food safety, the food industry and consumers each have crucial roles to play as well.

WORKING WITH THE INDUSTRY

SFA engages food industry stakeholders, including trade associations, major operators, and e-commerce platforms, on upcoming regulatory measures that would affect the food industry. These measures include the Points Demerit System, and Labelling & Claims requirements. This allows SFA's stakeholders to provide feedback on upcoming measures, which SFA uses to refine the regulatory measures before rolling them out.

Engaging major e-commerce platform operators

SFA continued to engage and work with the industry in FY 2020 to strengthen food safety standards through engagement sessions with food industry associations and other partners. These engagements covered topics such as enhancements to food safety regulatory oversight, recognition of food safety performance, and building industry competency in food safety. Recognising the evolving and increasing scale of online food sales in Singapore, SFA also established collaborative partnerships with major e-commerce platform operators to better manage food safety in online food sales.

Understanding consumers' views on food safety

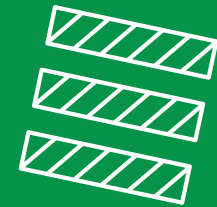
In FY 2020, SFA rolled out a consumer perception survey on food safety to gain insights into consumers' knowledge and attitudes towards food safety, food recalls, food labels, and advertising claims. The survey results helped us gauge consumers' perceptions and level of trust towards food labels and advertising, and understand the factors influencing consumers' decisions in dining out.

Following the survey, we partnered content producer 'Just Keep Thinking' (JKT) to develop a series of 'Myth Buster' videos and visuals aimed at educating consumers on food labelling, and providing a more in-depth look into the science of food safety. The videos and visuals were published on JKT's Facebook and Instagram pages, which have an audience of mainly young adults, and were posted on SFA's social media pages. The videos were also further amplified in the community through a network of 4,820 digital display panels located at HDB void decks/lift lobbies across Singapore.



ADAPTING TO UNKNOWNNS

Responding to the
COVID-19 Pandemic



The COVID-19 pandemic might have brought about unique challenges, but we worked hard to protect our food industry and supply - and proved that we are worth our salt.

RESPONDING TO THE COVID-19 PANDEMIC

As Singapore and the world continued to grapple with the COVID-19 pandemic in FY 2020, there was a heightened need to ensure a steady supply of safe food and further support Singapore's food industry.

Food supply chains were disrupted, and dining habits and lifestyles had to change significantly with the implementation of safe management measures to curb the spread of the virus. As a result, the food and beverage (F&B) industry was one of the hardest-hit sectors.

In FY 2020, SFA doubled down on efforts to secure Singapore's food supply, rolling out initiatives to accelerate local production and diversify Singapore's import sources. In addition, to help the industry ride out the pandemic and assist businesses in responding to the shifts in dining habits and consumer demand, we facilitated the issuance of new licences. We also worked with fellow government agencies and other industry stakeholders to ensure the adoption of safe management measures in the food industry and facilitate COVID-19 testing efforts to keep workers safe.

CHANGING THE WAY WE WORK TO ENSURE A STEADY SUPPLY OF FOOD

To help importers continually diversify import sources, SFA regularly organises and facilitates overseas food sourcing trips for the industry. Despite COVID-19 travel restrictions, our support for import source diversification remains unchanged. To circumvent these limitations, SFA organised five

virtual business matching sessions for local importers to explore business opportunities with Polish, French, and Indonesian exporters of meat and seafood.

In addition, SFA continued to regularly engage trade associations, key supermarket retailers, embassies, and trade offices to foster mutual understanding and solicit their feedback. In FY 2020, we organised 15 industry engagement sessions, through which we shared the latest regulatory updates, and industry members provided their feedback and suggestions.

The COVID-19 pandemic also presented greater impetus for us to strengthen our local food production capacities.

We hastened our plans and rolled out the "30x30 Express Grant" in April 2020 to help the agri-food industry significantly ramp up the local production of eggs, leafy vegetables, and fish. In September 2020, nine companies were awarded close to \$40 million of funding under this grant. These companies, which included vegetable and egg farmers, submitted proposals that would incorporate technologies such as smart and energy-efficient greenhouses, vertical integration growth systems, advanced hydroponics systems, as well as productivity-enhancing egg and manure collection systems. SFA is working closely with these farms to monitor their progress.

30X30 EXPRESS GRANT IN REVIEW (CUMULATIVE AS AT END OF FY 2020)



3030E amount committed

\$31.1m

3030E amount disbursed

\$4.48m

3030E projects approved

7

To further support local farmers, SFA continued to spark Singaporeans' interest in farming as a viable career option. Since physical interactions were restricted, we did so through virtual learning journeys and career fairs. As part of efforts to raise public awareness of local produce, SFA also organised outreach events online, such as virtual cooking competitions and demonstrations featuring local produce.

FACILITATING SHIFTS TO NEW BUSINESS MODELS

With safe management measures in place for much of the FY, new business models arose to address the subsequent shifts in consumers' dining habits and lifestyles. To support businesses, new licences were issued promptly to facilitate the industry's shifts to new business models.

REGULATING MAIN OPERATORS OF CLOUD KITCHENS

When dining-in was prohibited during the Circuit Breaker period between 7 April and 1 June 2020, food business models evolved to offer direct delivery to consumers' homes. This led to the growth of Cloud Kitchens, which are centralised medium- to large-scale commercial kitchens comprising multiple small-scale identical modular kitchen units. Each Cloud Kitchen is equipped with the necessary processing equipment to support the manufacturing of ready-to-eat food products for direct delivery to consumers through online food delivery platforms, without any direct retail sale or dine-in options.

In view of this development, SFA updated its licensing model. Previously, we only licensed

the individual kitchen unit under a Foodshop (Takeaway) licence. Now, SFA requires the overall operator of the facility to be licensed. This update in requirements strengthens regulatory control over the full scope of operations, including common shared spaces such as the finished product holding area, walk-in coldrooms, and dry store. This will mitigate food safety risks that can stem from these areas, such as the presence of expired products, cold-chain breakage due to improper maintenance of refrigerated facilities, and pest infestation due to poor maintenance.

ISSUING OF SPECIAL TEMPORARY LICENCES FOR MOBILE SALES AND CATERING KITCHENS

During the Circuit Breaker period, SFA also facilitated the



introduction of new business models to bring food retail closer to consumers' homes by approving the issuance of the Special Temporary Licence. These licences allowed mobile sales of non-perishable food such as dry groceries, bread, and pre-packed cakes in the community, reducing the time needed for consumers to commute.

Additionally, to meet the added catering needs of foreign workers quarantined in dormitories, SFA facilitated the set-up of a temporary kitchen for catering companies to take on additional orders.

PIVOTING OF NIGHTLIFE ESTABLISHMENTS TOWARDS F&B

As part of the control measures to prevent the spread of COVID-19, all nightlife establishments, including pubs, bars, nightclubs, discotheques, and karaoke lounges, were mandated to close from 27 March 2020. Following this, to support nightlife businesses amid their prolonged closure, the Government announced on 6 November 2020 that these operators were allowed to pivot to permitted activities including food and beverage (F&B) businesses.

To pivot to F&B businesses, operators had to first obtain approval from the Ministry of Trade and Industry (MTI) and apply for a change of use of their premises, from nightlife establishment to F&B, with the Urban Redevelopment Authority (URA). Once approvals were granted, and the requirements of a food business licence were met (including ensuring that

food handlers attended the Food Safety Course Level 1), SFA issued pivoted operators with an F&B licence.

ENSURING PIVOTED OPERATORS COMPLY WITH SAFE MANAGEMENT MEASURES

On top of meeting the requirements for SFA's licences, all individuals and businesses, including pivoted nightlife establishments, must also strictly adhere to existing safe management measures.

In FY 2020, ESG, SFA, SLA, STB, and URA conducted regular in-

spections of pivoted premises, and will continue to take strict enforcement action against operators who breach measures. Such operators may be fined, have their operations suspended, or have their licences revoked by SFA.

ENSURING CONTINUED OPERATIONS

Facilities such as local farms, slaughterhouses, and wholesale centres are key nodes of our food supply chain. To prevent disruptions to Singapore's food supply, SFA worked closely with operators of these



A routine inspection at a farm to ensure the adoption of safe management measures



facilities to implement safe management measures, so that industry members are able to continue their operations in a safe environment.

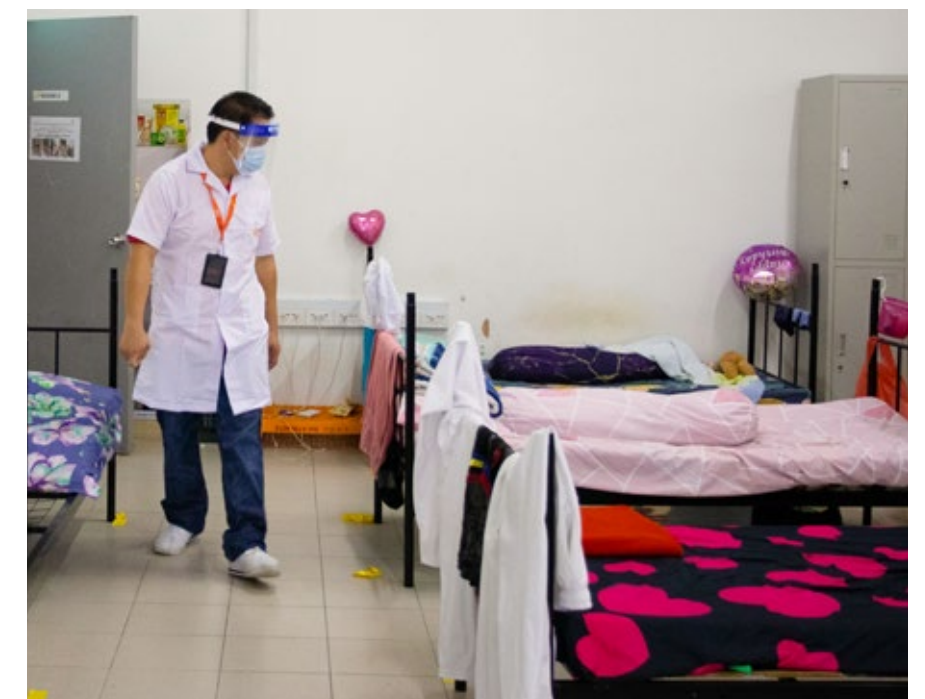
ENSURING THE ADOPTION OF SAFE MANAGEMENT MEASURES AT FARMS

SFA worked closely with local food farms during the Circuit Breaker and safe reopening periods to ensure they complied with elevated safe distancing measures and safe management measures, as well as to promptly address any lapses. On top of routine inspection visits, additional weekly checks were conducted at local food farms and their worker dormitories where close-living environments pose transmission risks. Ahead of Singapore's Phase 2 Reopening, we also provided guidance to farms on the hosting of educational visits for members of the public, to ensure a safe environment for visitors.

IMPLEMENTING SAFE MANAGEMENT MEASURES AT WHOLESALE CENTRES

To protect public health by minimising the spread of COVID-19 and to ensure business continuity, SFA worked closely with wholesale centres such as the PPWC and Jurong and Senoko Fishery Ports to implement

and tighten safe management measures in FY 2020 to minimise the risk of virus transmission. We also tightened access to these facilities, with only workers and registered trade visitors allowed entry following TraceTogether SafeEntry and temperature checks.





IMPLEMENTING SAFE MANAGEMENT MEASURES AT SLAUGHTERHOUSES

At the height of the COVID-19 pandemic in FY 2020, meat processing plants worldwide were identified as a hotspot for COVID-19 outbreaks. Slaughterhouses were found to be a high-risk sector that warranted close supervision, as the

cold processing environment, close quarters, and physically demanding work heightened the risk of COVID-19 transmission. Additionally, a significant proportion of slaughterhouse workers here lived in shared housing.

To ensure continued operations at our slaughterhouses

and to maintain a steady food supply in Singapore, SFA worked with the operators to implement safe management measures at both the slaughtering and workers' housing facilities. Unannounced checks at the slaughterhouses and at workers' dormitories were conducted regularly, in addition to our routine checks. In FY 2020, over 1,000 inspections were conducted at these premises, and the compliance rate remained high.

ENFORCING SAFE MANAGEMENT MEASURES AT FOOD ESTABLISHMENTS

SFA engaged food establishments to implement safe management measures throughout the various stages of reopening, including the setting up of one-metre distancing queue markings and ensuring the demarcation of seats at food establishments. Efforts were also taken to help food establishments implement the SafeEn-



try and TraceTogether check-in practices. These efforts were supplemented by regular inspections and enforcement against non-compliant operators and individuals.

KEEPING THE FOOD INDUSTRY SAFE

The workers in Singapore's food industry are key to maintaining the industry's operations, and in turn, the nation's food supply. To keep workers in the food industry safe with the gradual reopening of Singapore's economy, SFA partnered with the MOH to conduct COVID-19 testing operations and enable early identification and containment of COVID-19 infections in FY 2020.

From August to November 2020, COVID-19 swab tests were conducted for over 2,000 local workers in key nodes of Singapore's food supply chain, including poultry slaughter-

From August to November 2020, COVID-19 swab tests were conducted for over 2,000 local workers in key nodes of Singapore's food supply chain, including poultry slaughterhouses, a pig abattoir, and the PPWC.

houses, a pig abattoir, and the PPWC.

Voluntary COVID-19 testing was also extended to personnel at hawker centres, markets, coffeeshops, and HDB retail stores, as well as food delivery personnel. Since September 2020, SFA, as the sector lead for coffeeshops, worked with agencies such as NEA, HDB, People's Association (PA), and ESG, to organise community testing operations. As at 31 March 2021, over 1,600 people from 250 coffeeshops were tested negative for COVID-19. SFA also facilitated the prioritisation of the COVID-19 vaccination for workers at food establishments, many of whom have frequent frontline interaction with the public.

NURTURING GLOBAL PARTNERSHIPS

Strengthening
International Relations



Global partnerships allow us to safeguard and advance Singapore's interests, collaborate on capacity building, and contribute to regional developments in food security.

Our strong partnerships with our international counterparts enable us to build upon each other's strengths in food, agriculture, fisheries and research so that we continue to enjoy a steady supply of safe food.

STRENGTHENING INTERNATIONAL RELATIONS

Singapore maintains close ties with the international community in the spirit of exchange and collaboration. In FY 2020, we continued to participate in bilateral, regional, and international collaborations to safeguard and advance Singapore's interests, as well as contribute to regional and international developments in food security.

REGIONAL AND INTERNATIONAL EXCHANGES ON FOOD SECURITY AND FOOD SAFETY

Throughout FY 2020, SFA continued to reaffirm relationships with our foreign counterparts through regional and international meetings. This allowed us to gain insights and updates on developments that can better inform policymaking and planning. These meetings were held virtually due to travel restrictions brought about by the COVID-19 pandemic. Key meetings included:

Aug 2020	Special Senior Officials Meeting (SOM) for the 41 st ASEAN Ministers for Agriculture and Forestry (AMAF), Special SOM 19 th AMAF Plus Three, 5 th ASEAN-Russia Senior Officials Meeting on Agriculture and related meetings
Sep 2020	G20 2 nd Agriculture Deputies Meeting & Agriculture and Water Ministerial Meeting
Sep 2020	27 th Session of the United Nations Food and Agriculture Organization (FAO) Committee on Agriculture
Sep to Oct 2020	35 th FAO Regional Conference for Asia and the Pacific
Oct 2020	Preparatory-SOM 42 nd AMAF, 20 th SOM-AMAF Plus Three, 6 th SOM-ASEAN-India Ministerial Meeting in Agriculture and Forestry (AIMMAF), 42 nd AMAF, 20 th AMAF Plus Three, and 6 th AIMMAF meetings
Oct 2020	APEC Ministerial Policy Dialogue on Food Security and related meetings
Sep to Nov 2020	43 rd Codex Alimentarius Commission
Jan 2021	13 th Berlin Agriculture Ministers' Conference
Jan 2021	Inaugural meeting of the One Health Global Leaders Group on Antimicrobial Resistance
Feb 2021	47 th Session of the FAO Committee on World Food Security

PROMOTING AND SAFEGUARDING SINGAPORE'S INTEREST IN FOOD, AGRICULTURE, AND FISHERIES

As a budding food technology hub and to position Singapore as a player in the setting of international food safety standards, SFA continued to contribute to regional and international efforts to promote innovations in food technology, as well as develop new standards and practices to enhance food safety.

ESTABLISHING A NATIONAL CODEX OFFICE

The Codex Alimentarius Commission, or Codex, is an international food standard setting body of which Singapore is a member. Established under FAO and WHO, it aims to protect consumers' health and ensure fair practices in the food trade.

In FY 2020, SFA established the National Codex Office (NCO) to strategise and coordinate Singapore's contributions to Codex. The NCO seeks to influence the setting of international standards and advocate the adoption of these standards by

other countries, as well as gain international recognition for Singapore's food safety system.

Following the NCO, SFA will set up a multi-stakeholder National Codex Committee (NCC) comprising government and industry representatives, and academia. The NCC will provide advice on national positions on Codex matters based on science and Singapore's interests, and on matters relating to the development and adoption of international standards in Singapore.

CO-ORGANISING A VIRTUAL EXCHANGE WITH ISRAEL ON AGRI-FOOD TECHNOLOGY

To foster meaningful business relationships and promote collaboration and knowledge sharing among players in the Singapore and Israeli agri-food tech spaces, SFA and the Israeli Embassy organised a virtual Israel Singapore Agri-Food Exchange (ISAFE) in February 2021. The exchange attracted about 400 participants who attended panel discussions on alternative proteins, aquaculture, urban/vertical farming, and R&D collaboration.

ENHANCING THE SAFETY AND COMPETITIVENESS OF SEAFOOD PRODUCTS WITH MFRD

SFA's MAC is the collaborating centre of the Southeast Asian Fisheries Development Centre (SEAFDEC). It promotes post-harvest technology development in regional fisheries by implementing activities under SEAFDEC's Marine Fisheries Research Department (MFRD) programmes.

In October 2020, MFRD hosted the inception meeting of a project that seeks to promote ASEAN Member States' adoption of regional guidelines on good manufacturing and handling practices for ready-to-eat raw fish and fisheries products, and high-pressure processing protocols for seafood. These will help to enhance the safety and competitiveness of their seafood products.

IDENTIFYING NEW INNOVATIONS THROUGH THE UNDP CULTIV@TE PROGRAMME

SFA has been supporting the Cultiv@te programme under the Global Centre for Technology, Innovation and Sustainable Development since 2019.



Inception meeting hosted by MFRD

The programme, a joint initiative by Singapore and the United Nations Development Programme (UNDP), provides an avenue for us to tap into UNDP's network and global outreach for technological solutions in urban agriculture.

In April 2020, through the Cultiv@te programme, SFA identified Canadian start-up Phytochem Consulting, which offers Wely Device, a type of technology that could potentially improve irrigation and disease management in local farms. The start-up was one of several teams from five countries which had responded to SFA's challenge call for technology solutions to effectively manage pest and disease outbreaks in urban farms to produce safe food, with minimal impact on humans and the environment. SFA is facilitating the customisation of the Wely Device to suit farms in Singapore, with plans for pilot and test-bedding to commence in end-2021.

COMBATTING ANTIMICROBIAL RESISTANCE

In FY 2020, Singapore joined the One Health Global Leaders Group on AMR to advocate for practical, science-based, and coordinated global action against AMR across the human, animal and plant health, and environment sectors. The group was established by FAO, WHO, and OIE in consultation with the UN Secretary-General and with representatives from the United Nations Environment Programme. It aims to provide political leadership to address AMR issues.

SFA currently leads the coordination of ASEAN's AMR efforts in the livestock and aquaculture sector, including in the development of the ASEAN guidelines for prudent use of antimicrobials in aquaculture and for techniques for veterinary drug residue detection in aquaculture products.

Additionally, SFA is the implementing agency for the project 'AMR in Aquaculture – Laboratory Capacity Building, Risk Analysis and the Way Forward' under the Strategic Plan of Action for the ASEAN Sectoral Working Group on Fisheries (ASWGFi), with endorsement from SOM-AMAF and funding support from the Japan-ASEAN Integration Fund (JAIF). The project aims to enhance the capacity and coordinate the efforts of aquatic animal health authorities in ASEAN Member States to combat AMR in the aquaculture sector.

As part of the project, a laboratory workshop on drug residue detection in aquaculture products was conducted in December 2019 for ASEAN participants to build laboratory capacity. In February 2021, SFA, in collaboration with NParks, ASEAN secretariat, and with technical assistance from FAO, organised two events – the Introductory Training Course on Risk Analysis for AMR Arising from Use of Antimicrobial Agents in Aquaculture, and the ASEAN Consultative Meeting to develop a five-year regional action plan on AMR in aquaculture. The plan aims to provide training on performing risk analysis for AMR arising from the use of antimicrobial agents in aquaculture, and plan the way forward on AMR in aquaculture with ASEAN Member States.

STRENGTHENING INTERNATIONAL PARTNERSHIPS

In FY 2020, Singapore signed Memorandums of Understanding (MoUs) with China and France.

Singapore's MSE signed an MoU with China's State Administration for Market Regulation (SAMR) on 8 December 2020. Under this agreement, both sides commit to strengthening cooperation and exchanges in food safety to safeguard the health and safety of consumers and promote bilateral trade. This will be done through the exchange of information and experience in standards setting and risk assessment, as well as in food testing, inspection, and certification.

On 14 December 2020, SFA signed an MoU with the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) to promote cooperation between both national agencies in areas of food safety, such as in the risk assessment of chemical and microbiological food safety hazards, safety assessment of novel food, and emerging food safety risks.

COOPERATION WITH ASEAN COUNTERPARTS

SFA continued to forge strong partnerships with our counterparts from like-minded countries to strengthen Singapore's food supply strategies and stay abreast of global agri-food and agro-technology developments. With the disruptions brought about by the COVID-19 pandemic, bilateral meetings to promote cooperation and collaboration between Singapore and our regional neighbours grew more crucial.

SFA and Brunei Darussalam's Ministry of Primary Resources and Tourism (MPRT) signed an MoU on 8 February 2021 to

enhance bilateral cooperation in the fields of agri-food and agro-technology. The MoU underscores the commitment of both countries to deepen collaboration in agri-food and agro-technology-related fields through information and knowledge exchange, as well as capacity building and human resource development. Potential areas of collaboration include agriculture fisheries and aquaculture, agro-technology, productivity, standards, and quality.

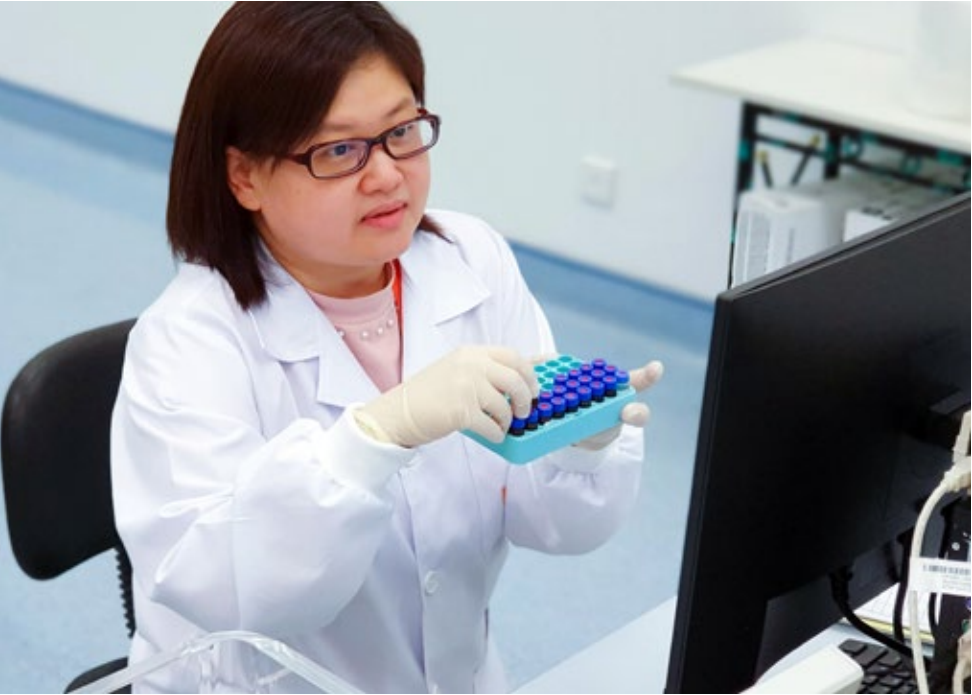
The Agri-business Working Group (AWG) is one of the six Bilateral Economic Working Groups (6WG) between Singapore and Indonesia. On 25 August 2020, SFA and Indonesia's Ministry of Agriculture

(MOA) met at the 16th AWG Meeting, where the proposed terms of reference of the various sub-working groups and proposed key performance indicators and activities for the next five-year work plan were agreed on. The new plan, to be carried out from 2021 to 2025, will focus on facilitating agri-trade in agricultural products and seafood by promoting cooperation and mutual understanding on regulatory issues for both countries.

HOSTING DISTINGUISHED VISITORS

In FY 2020, SFA received foreign dignitaries and officials, and shared with them our food security strategies, regulatory control, and functions.

Date	Visitor
27 Nov 2020	H.E. Sandra Jensen Landi, Ambassador of the Kingdom of Denmark to Singapore
10 Dec 2020	H.E. Dr Norbert Riedel, Ambassador of Federal Republic of Germany to Singapore
14 Dec 2020	H.E. Mario Rui dos Santos Miranda Duarte, Ambassador of the Portuguese Republic to Singapore
4 Jan 2021	H.E. Sagi Karni, Ambassador of the State of Israel to Singapore
16 Feb 2021	H.E. Fabrice Filliez, Ambassador of the Swiss Confederation to Singapore



SERVING OUR NATION

Enabling Excellence



Our relentless dedication to excellence inspires our people to be at the top of their game when it comes to efficiency and quality service.

SFA is committed to developing the competencies of our staff and empowering them to better serve the needs of the nation.

ENABLING EXCELLENCE

At SFA, we are committed to ensuring the safety and security of Singapore's food supply by constantly preparing for the future, ensuring efficient operations, and putting our customers first. We nurture and empower our officers by developing their competencies and prioritising their well-being, so that they can better serve the needs of Singapore and Singaporeans.

RESTRUCTURING FOR EFFECTIVENESS

To ensure greater organisational efficiency and effectiveness, SFA established three new divisions in FY 2020, namely: The Joint Operations Division (JOD), the Science & Technology Division (S&TD), and the Industry Development and Community Partnership Division (IDCPD).

JOD will oversee and coordinate all operational matters across SFA, including licence and permit issuance, enforcement, investigation, and prosecution, which were previously cut across the different divisions. S&TD focuses on deepening SFA's operations-technology capabilities. IDCPD will en-

hance engagement and partnership with both the industry and community, while formulating industry standards, incentives, and grants.

We also set up a Data, Research and Transformation Department to deepen our capabilities in data science, market research, and statistics, to build up SFA's capabilities in areas such as service journeys, design thinking, and Robotic Process Automation.

HARNESSING DIGITALISATION TO ENHANCE OPERATIONS

SFA is constantly enhancing its processes through technology and digitalisation, to enable us

to enforce our standards more effectively and better serve the needs of our licensees and Singaporeans.

In FY 2020, SFA implemented an online service for tenants of the JFP, SFP and PPWC where tenants could download tenancy renewal offers and monthly statements, as well as make payments for rental and administrative fees. The transition to electronic submissions by tenants resulted in time savings and improved efficiency, and minimised the possibility of errors arising from manual data entry.

SFA also collaborated with GovTech to develop an on-

line application form via the FormSG platform to enable quicker approvals for members of the public intending to visit poultry and coastal fish farms. This also greatly reduced the administrative burden on farm licensees.

INCULCATING A CULTURE OF INNOVATION

To encourage and empower staff to explore innovative ways of improving work processes, SFA funded two projects under the SFA Inno Seed Fund in FY 2020. The first project was on the automation of rotifer counting at SFA's MAC, which resulted in 42,000 hours of time-savings, as it replaced the need for time-consuming manual work. This project also contributed to the Public Service Division's Million Hours Challenge initiative in FY 2020. The second project involved the use of hyperspectral imaging to enable the early detection of pests in vegetables. This time-saving method successfully enabled farmers to quickly detect the presence of pests, thereby preventing infestations that can lead to extensive damage to crops.

ENHANCING MANAGEMENT OF PUBLIC ENQUIRIES AND FEEDBACK

SFA is committed to delivering a seamless and convenient experience for all our customers.

In FY 2020, we outsourced our hotline answering services. We are currently working with the service provider to operate a hybrid call centre leveraging our in-house resources to manage feedback and enqui-

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SFA continued to strive to push out useful information through our digital platforms so that our customers can easily find the help and answers they need. One key initiative during the FY was the launch of a mobile app known as myENV, which enables customers to submit their feedback and enquiries to SFA, NEA, and PUB via a single touchpoint. The app automatically routes cases to the relevant agency for follow-up. Users can also receive push notifications on food recalls and suspension of food establishments thanks to the app's location-based feature and alerts.

DEVELOPING OUR PEOPLE

SFA continued to invest in building our people's skills and competencies to keep them future-ready and well equipped to excel at work.

IMPLEMENTING A JOB ROTATION FRAMEWORK

SFA recognises the importance of building a more agile work-

force. We launched a Structured Job Rotation programme in FY 2020 to enable officers to gain critical experience, develop leadership skills, and build new networks and capabilities through internal job postings.

LEARNING FROM EXTERNAL EXPERT AND IN-HOUSE PROGRAMMES

In January 2021, SFA hosted and moderated a discussion for 150 officers in the MSE family during a sharing session by Ms Ho Ghim Siew, Head of Group Commercial, Strategy & Cargo Solutions at PSA International. Participants gained valuable insights into the impact of the COVID-19 pandemic on logistical operations and the importance of supply chain resilience, including that of food, for Singapore.

To strengthen our people's capabilities, we rolled out in-house e-learning programmes on mobile platforms that gave officers easy access to training materials. In October 2020, we also organised the second SFA Science Day, with the theme Science for Food and Environmental Sustainability. The webinar brought together colleagues from the MSE family to

MSE DARE TO DO AWARD



Pioneering an Aquaculture Nutrition Facility at the Marine Aquaculture Centre

MAC, SFA

Although the pandemic restricted staff from coming together physically, we sought alternative means to show care and support for one another. Divisions organised virtual team bonding sessions and sent out specially curated care packs to staff.

exchange scientific knowledge on emerging developments in food safety, water quality, and waste management.

CARING FOR OUR PEOPLE, COMMUNITY, AND ENVIRONMENT

SFA cares for our workforce, as well as the community and environment. In FY 2020, we showed concern and support to our staff in spite of the challenges posed by the COVID-19 pandemic. A series of staff bonding, welfare, and recreation activities, as well as conservation activities, were

organised in compliance with prevailing safe management restrictions and measures.

SHOWING CARE AND SUPPORT

The COVID-19 pandemic brought out the spirit of care throughout SFA. Our leadership team showed support and appreciation for the efforts that officers put in to overcome the challenges of enforcing safe management measures on the ground during the Circuit Breaker period. As part of staff engagement sessions held in FY 2020, SFA's CEO visited site offices to understand operational

challenges and identify ways to improve work processes.

Although the pandemic restricted staff from coming together physically, we sought alternative means to show care and support for one another. Divisions organised virtual team bonding sessions and sent out specially curated care packs to staff. In addition, we hosted an SFA appreciation event, where staff enjoyed an afternoon of online entertainment and games. Our leadership team also took the opportunity to thank staff for their hard work via a special appreciation video that was screened during the appreciation event.



Staff engagement sessions by SFA CEO Lim Kok Thai

SFA organised a series of recreational, health, and family-oriented activities for our staff in FY 2020 to strengthen rapport amongst our people and encourage them to play a part in environmental conservation efforts.

STAFF WELFARE AND RECREATION



Keeping fit and healthy

- Free flu vaccinations
- 'Eat with Your Family Day' and 'Send your Kids to School Day'
- Virtual Fitness and Healthy Lifestyle Challenge to encourage officers to keep fit and maintain healthy lifestyles while working from home



Strengthening our bonds

- Online staff appreciation event with entertainment and attractive lucky draw prizes
- Virtual divisional team bonding activities



Doing good together

- Blood donation drive
- 'Read for Books' charity book drive
- Book-Drop Charity for Needy Student (by NTUC)
- Purple Parade 2020 – A movement to support inclusion and celebrate abilities of people with disabilities
- SFA Cares for the Courage Fund: Raised a total of \$12,880 for Community Chest's Courage Fund through two donation drives

ENVIRONMENTAL AND CONSERVATION EFFORTS



- Participated in Earth Hour 2020 by switching off lights at SFA premises with no night operations
- Promoted environmental sustainability by raising staff awareness on energy-saving initiatives in the office and at home
- Discouraged and stopped the use of single-use cutleries and plastic water bottles at meetings and events

