



Japanese Factory Visit Tour for Development of Food-Value-Chain in ASEAN

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Outline

- Introduction to Singapore
- Food value chain – Production
- Food value chain – Manufacturing and processing
- Food value chain – Distribution
- Food value chain – Consumer understanding
- Conclusion

Singapore – the island city-state



Area of Singapore: 719 km²
Area of Tokyo: 2144 km²



- **Singapore** – a **vibrant global city** of 5.7 million people including 1.3 million foreign expatriates
- Multi-cultural, multi-racial, multi-religious country with 4 main ethnic groups and official languages
 - Racial and religious harmony is **extremely important!**

Main races

Chinese (74.3%) Indians (9.1%)
Malays (13.3%) Eurasians (<2%)

Main languages

Bahasa Malayu (national language)
English (working language)
Mandarin Chinese

Tamil
Singlish(?)

Food in Singapore

- National “hobbies”: shopping and **eating**
- Food plays a very big role in the Singaporean identity and culture
- Heavily influenced by local races, and global trends due to Singapore’s connectivity



SATAY



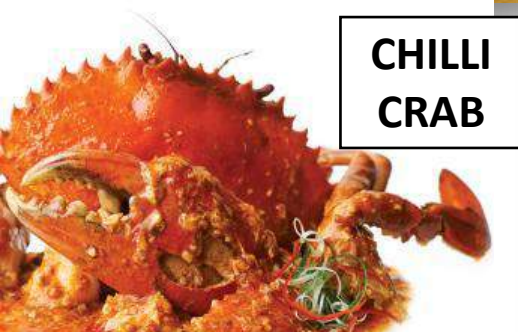
KUEH LAPIS



CURRY FISHHEAD



NASI LEMAK



**CHILLI
CRAB**



CHICKEN RICE



HOKKIEN MEE



LAKSA

Singapore's agricultural scene



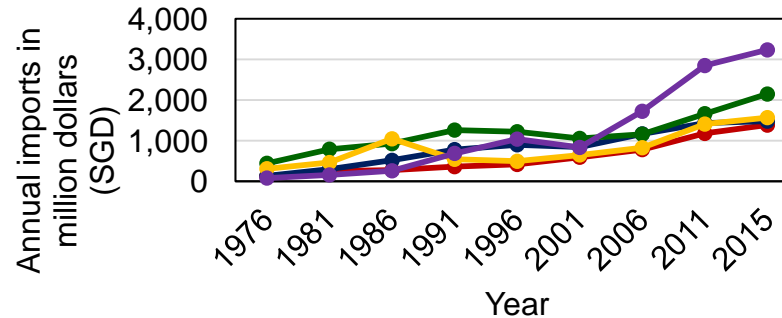
Figure 3: Agriculture land in Singapore, 1960 (Koninck, et al. 2008)



Figure 4: Agricultural Land Use in Singapore, 1984 (Koninck, et al. 2008)



Figure 5: Agriculture Land in Singapore, 2005 (Koninck, et al. 2008)



- Meat and meat preparations
- Fish, seafood and preparations
- Vegetables and fruits



Food security in Singapore

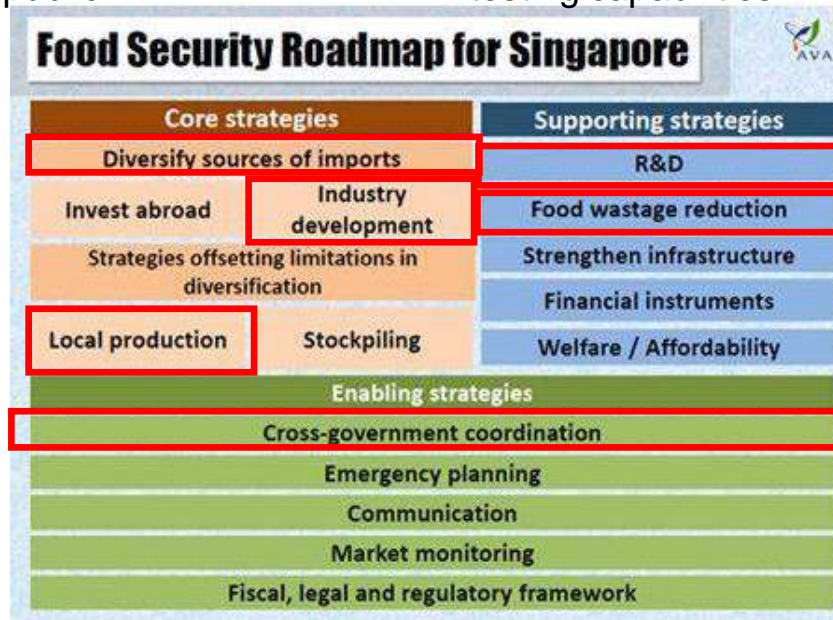


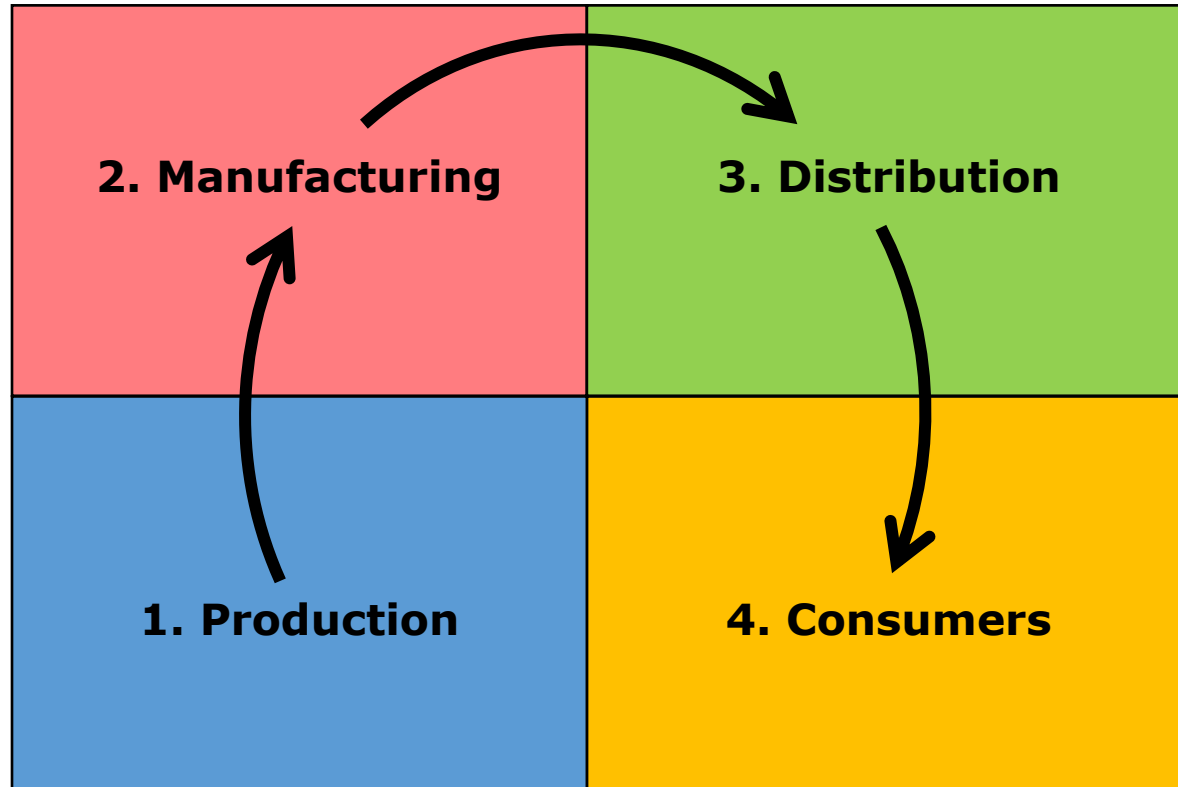
Setting the Pace...

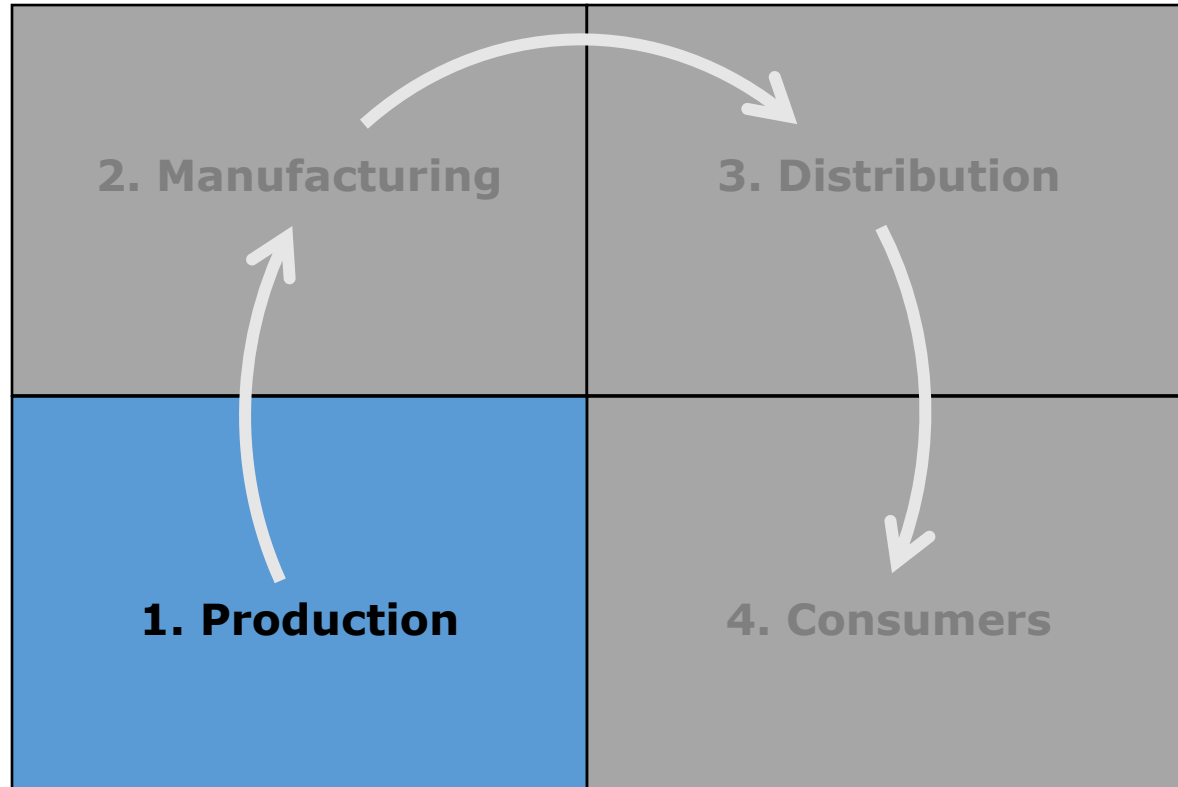
for the good things in life.



- Agri-Food and Veterinary Authority of Singapore (**AVA**) – governmental agency responsible for:
 - Ensure **food safety and security**
 - Facilitating **agri-trade** and **educating** the public
 - Safeguard **animal and plant health**
 - **R&D** in agrotechnology, food testing capabilities







Production – Singapore's strengths



Agrotechnology parks

High-tech agricultural areas, > 200 farms producing agricultural products

- Vertical farming: patented farming system with high yield and quality, and low maintenance
- Hydroponics and aeroponics farm: production of beansprouts and other leafy vegetables
- Top exporter for ornamental fishes

Research and development

Strong focus in agricultural R&D

- Research institutes – National University of Singapore (NUS), Agency for Science, Technology and Research (A*STAR)
 - GloFish: ornamental fishes with applications in pollution detection
- MNCs – contributes to development of new technologies in agriculture
 - Panasonic: indoor farming using LED light, vertical farming

Production – Challenges faced by Singapore

Limited land space for agricultural use

- < 2% land for agricultural use
- Remaining for residential, urban, military, and industrial use



High amounts of food waste

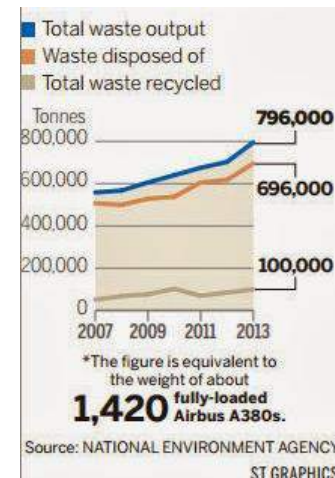
- 796 000 tonnes of food waste in 2013 (**2 bowls of rice per person each day!**)
- Increase of > 40% over last decade



Figure 5: Agriculture Land in Singapore, 2005 (Kominck, et al., 2008)

Limited manpower

- Younger generation prefer white-collar jobs instead of working on farms
- Very few workers involved in agriculture industry as growers and producers (< 1%)



Production – Learning points in Japan

Development of technology for efficient utilisation of land space

Pasona

1. Urban farming
 - LED technology
 - Integrating agriculture into urban working spaces

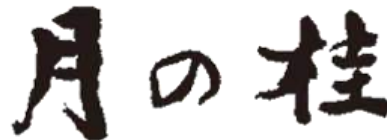
Takii Seed Farm

2. R&D in farming technology
 - Treating of seeds to encourage germination
3. Close collaboration with growers and farmers
 - Allows for understanding of needs in agriculture industry

Repackage agriculture-related careers

Pasona

1. Attracting younger generation requires a change in mind set
 - Pride in a career as a farmer
 - Less stressful life – able to focus on other aspects other than work



Reduction of food wastes

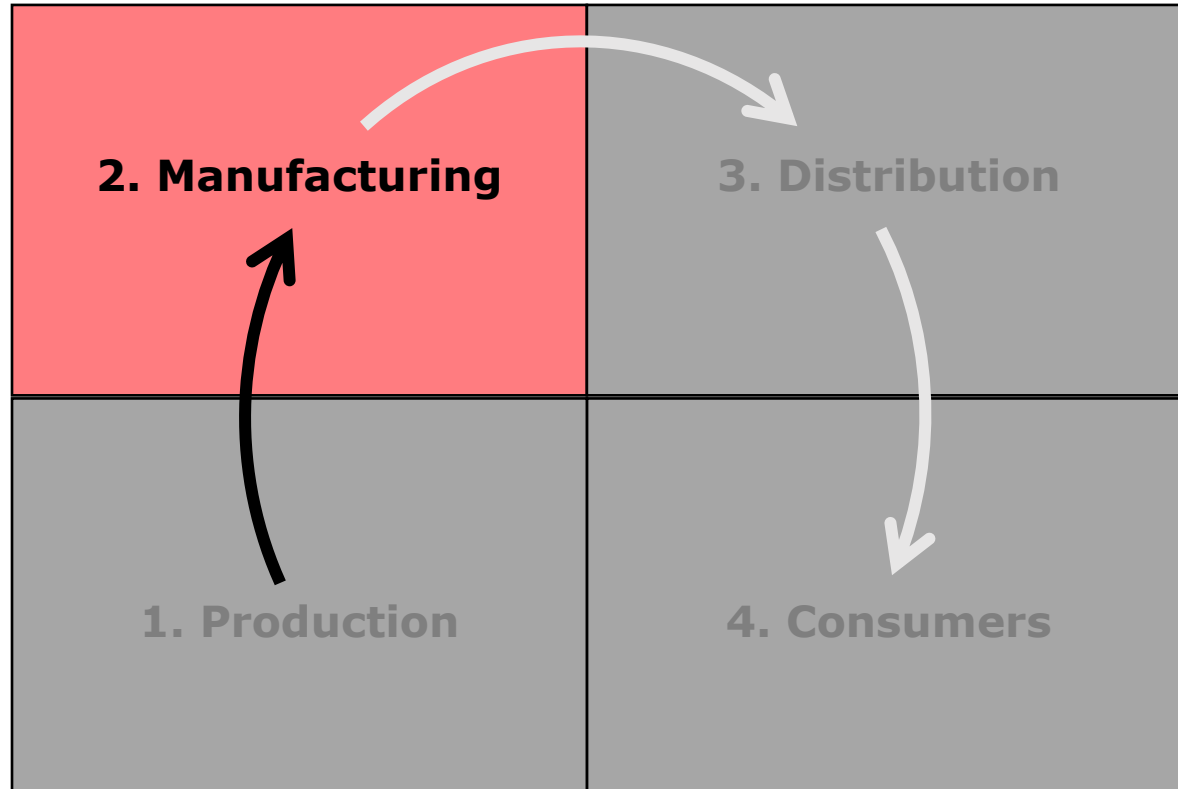
Takii Head Office

1. Use of robotics in sorting technology over manual cosmetic filtering
 - Aid in sorting of unwanted produce by colour, size, etc

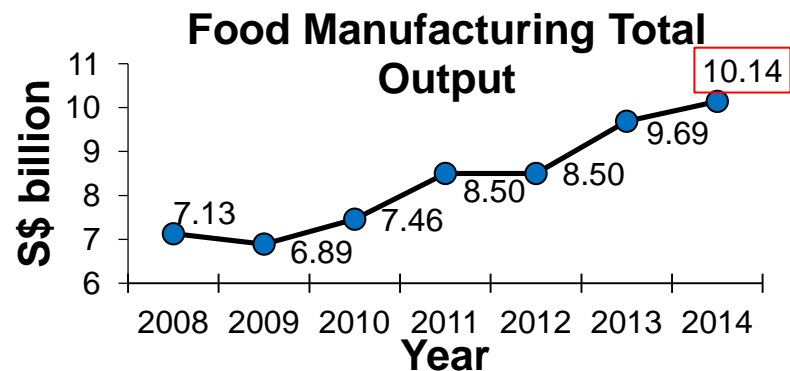
Ajinomoto & Tsukino Katsura

2. Use of by-products in development of other food products
 - Sake lees in traditional foods
 - Animal feed

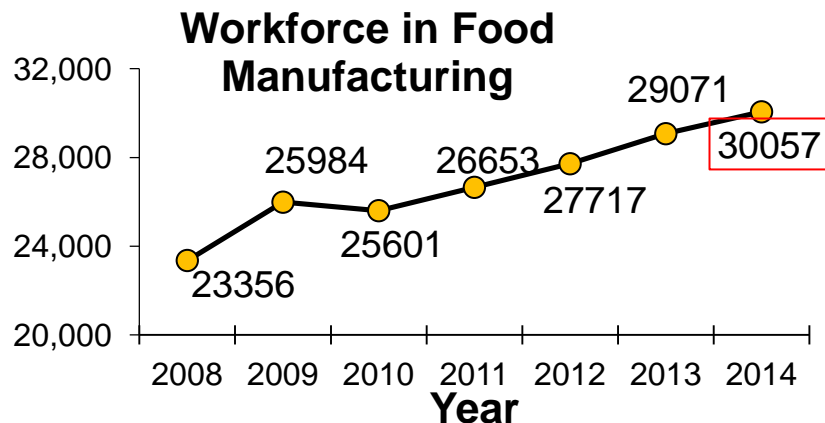
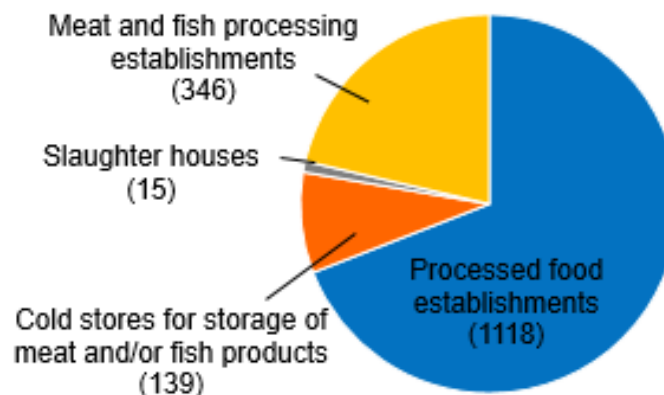




Food manufacturing and processing in Singapore



GDP contribution = 0.7%



Mainly Small Medium Enterprises (SME)

- Beverages
- Noodles
- Snacks
- Edible oils
- Coffee/Tea
- Sauces/Seasoning/Condiments
- Confectionery
- Soy products
- Canned food
- Ready-To-Eat-Food

Japanese food factories in Singapore



FUJI OIL



kikkoman



meiji



nissin



POKKA



**SAPPORO
LION**



TAKASAGO



Yakult

Manufacturing – Singapore's strengths

Multi-cultural background

- Capability to develop a diversified range of innovative food products for the region

Government funding

- Government provides grants and incentives for business to set up operations in Singapore

Good international image

- Strict enforcement laws (Strikes and protest are illegal)
- High hygiene and food safety standard (HACCP)
- Strict adherence to international law
- Good business practice and integrity is preserved
- No natural disasters

Manufacturing – Challenges in Singapore

Heavy reliance on overseas suppliers for raw materials

- Lack of agricultural activities in Singapore due to land scarcity
- Reliance of overseas suppliers reduces competitive cost of local food manufacturers

Small domestic market

- Population of 5.7 million
- Lack of economies of scale due to small size of SMEs
- Insufficient volume to justify investment in new technology and R&D

High operating cost

- High land, labour, utilities cost and need to import raw materials



Manufacturing – Challenges in Singapore

Low image of the food manufacturing

- Difficulties in attracting skilled labour and professionals to join the sector
- Only 16% of Singaporeans would consider working in the food manufacturing industry. 60% view food manufacturing as labour intensive with very manual work

Insufficient management depth or professionalism

- Food businesses are predominantly family-run and rely on traditional business methods
- Resistance to change → little to none R&D and product development activities

Food industry needs young talent, but misconceptions pose a challenge

Manufacturing – Learning points from Japan

Embracing innovation and technology to improve efficiency and competitiveness

Fuji Oil: Soluble soy polysaccharides, ultra soy separation (USS), enzymatically-prepared emulsifiers

Ajinomoto: Hondashi (Instant dashi stock)

Automation of process line: Improve efficiency and reduce amount of manual work



Utilization of by-products and waste to increase value addedness while reducing impact on the environment

Fuji Oil: Soluble soy polysaccharides

Ajinomoto: Fertilisers from fish innards, purification of other amino acids from broth



Soluble soy polysaccharides (SOYAFIBE)

Diversification of product line to remain relevant and improve competitiveness

Fuji Oil: SSP, Soy cream, low-fat soymilk

Ajinomoto: Bio-Fine and Pharmaceuticals

Megmilk Snowbrand: Flavoured cheeses

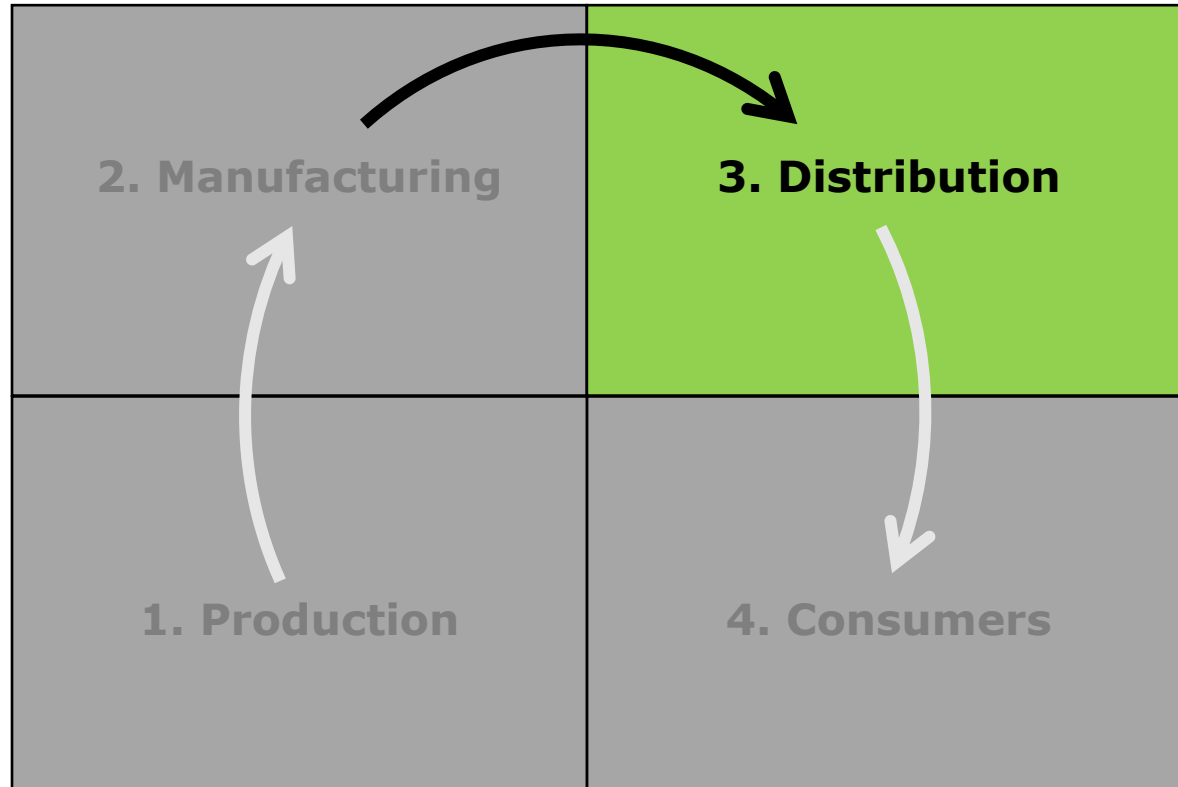


Using quality ingredients and retaining tradition to uphold image of company

Yoshinoya: Beef bowls and pickles

Tsukino Katsura: Traditional method of fermenting sake





Food distribution in Singapore

Wholesale centers



Jurong Fishery Port

- Port for foreign fishing vessels (Indonesia), land (Thailand) or air (Myanmar, Vietnam)
- Wholesale fish market (110 market lots)



Pasir Panjang Wholesale center

- Fruits & vegetables
- Proximity to Pasir Panjang port

Limitations

1. **Absence** of an **organized layout** for middleman wholesalers' stalls
2. **Hygiene issues**, **dated infrastructure**

Food distribution in Japan

Ota Market



Learning points

- **Organized** wholesale stalls layout with proper hygiene
- **Grading system** → Value-adding of products (Premium quality)
- Oversight of Tokyo Metropolitan Government
 - **Good trusting relationship** between stakeholders
- Optimum position of the market (**Proximity** to land, air and sea infrastructure facilities)

Food distribution in Singapore

Supply chain management system

Case study: Seo Eng Joo Frozen Food Pte Ltd

- Moves \approx 30,000 pallets of chilled, frozen and dry goods in a day
- Upgraded to **Microsoft Dynamics NAV** (Advanced order management system) in 2015
- **Effective inventory control** \rightarrow Smooth-transition between different companies' functions
- **Improved operational efficiency** \rightarrow Facilitates inventory-picking
- **Improved visibility** \rightarrow Company's performance analyses
- **Scalability**

Limitations

- Singapore is a small domestic market \rightarrow Lack of incentive to justify the upgrading to a more advanced management system
- High capital cost \rightarrow Lack of resources for small and medium enterprises (SMEs)

Food distribution in Japan

Case study 1 : Megmilk Snowbrand Co., Ltd.

- Manufacturing execution system
 - **Resource planning** for production/manufacturing process upon order receipt
 - IMPACT: **Efficiency**
- Supply chain management system
 - IMPACT: **Traceability**



Case study 2 : Takii & Co., Ltd

- Computerized barcode system for distribution
 - IMPACT: **Traceability**

Learning points:

- Such systems are essential for efficiency or accountability
- Singapore government could provide grants to help SMEs adopt such supply chain management systems

Food distribution in Singapore

Cold chain management system in Singapore

- Introduced in **1999**
- Enhanced food safety, businesses' sustainability and reduce food wastage
- Crucial for Singapore (Food-importing nation)
- 2007 – New guidelines on cold chain management of fruits and vegetables

Case study: SATs Coolport, SATS Ltd.

- 8000 m² facility with rooms offering temperature programming
- Strategic location (Changi International Airport)
- Halal-certified



Case study: Keppel Telecommunications & Transportation Ltd

- Singapore's reputable capabilities in logistics
- Collaborated in the development of cold chain facilities in Jilin and Anhui, China

Food distribution in Japan

Cold chain system in Japan

Case study 1: Yoshinoya Holdings

1. **Alignment** of delivery truck doors to the shutter of the meat processing center
 - **IMPACTS** - minimize meat's temperature fluctuation
2. Workers' welfare
 - Robotic arm to alleviate workload of workers during loading/unloading

Case study 2: Megmilk Snowbrand Co. Ltd.

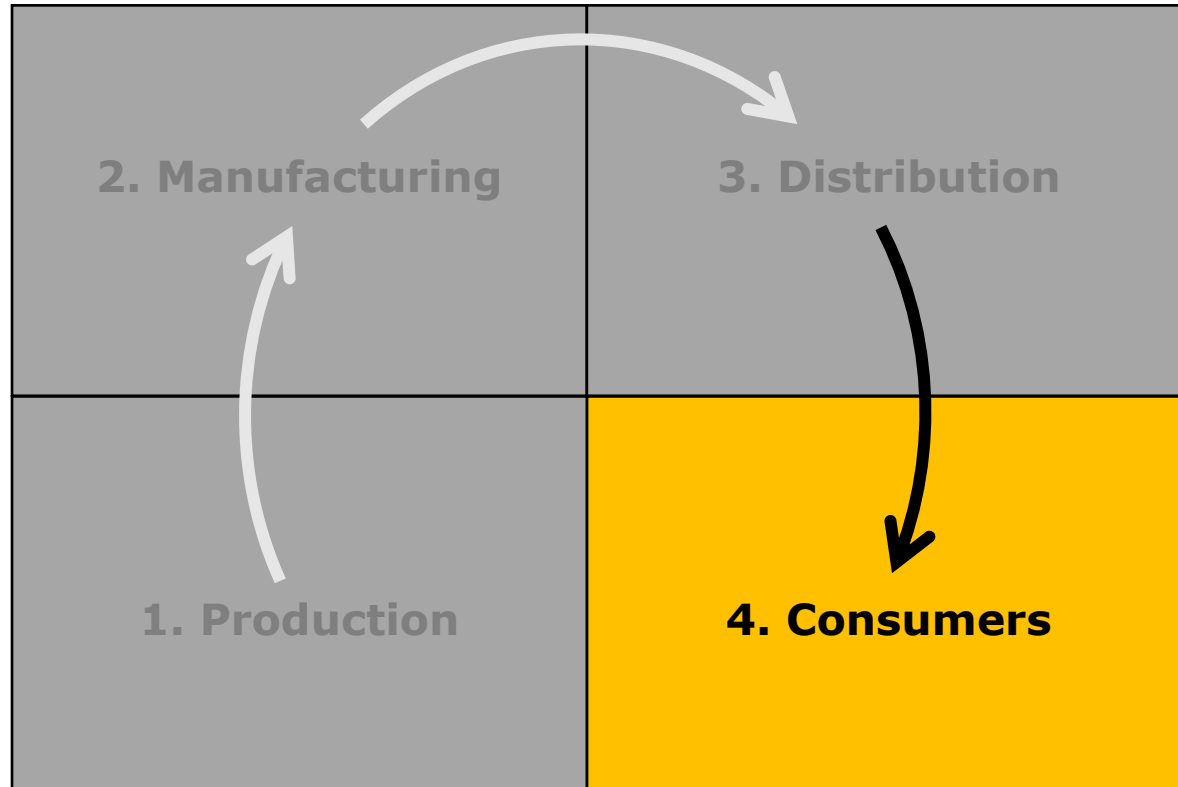
1. **Sealing of gaps** between delivery truck doors and shutter doors of processing center to **limit exposure to contaminants**

Case study 3: Kokubu Group Corp.

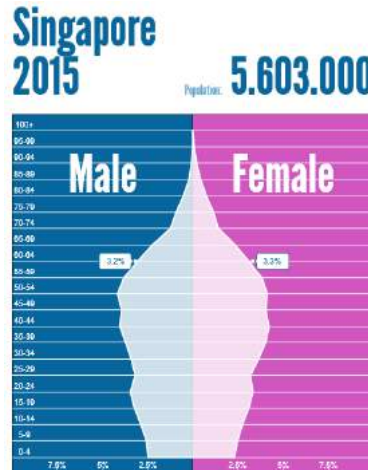
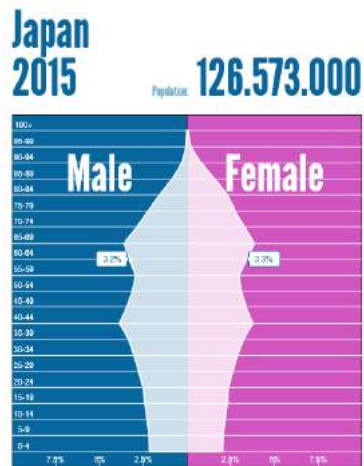
1. Adjustable “curtains” to **seal gap** between truck and transportation area

Learning points

- Plugging intricate gaps in the cold chain management system



Consumers – Aging population



Age	Japan (2015)	Singapore (2015)
< 20	17.4%	21.7%
20 – 64	55.5%	66.6%
≥ 65	27.1%	11.8%

Challenge in Singapore

Prevalence of **under-nourishment in the elderly: 30 – 52%**

Reasons

- ☹ Reduced sense of **taste** and **smell**
- ☹ Reduced ability to **chew** and **swallow**
- ☹ Too weak or lazy to **prepare food**
- ☹ **Poor nutrition knowledge**

→ Government efforts

- More studies on elderly nutrition
- Training for cooks in nursing care homes – food preparation

***No packaged ready-to-eat food specially for the elderly**

Consumers – Aging population

Japan: Specialised food for the elderly (“Nursing Care Food”)

Fuji Oil

- Delicious DHA
- Soy products

Soft Ingredient Series Served for People Receiving Nursing-Care 09

Fuji Oil Group's soybean-based soft ingredient series are served to people receiving nursing-care to provide nutritious support to them using easy-to-swallow soft ingredients. The taste and soft mouthfeel of these already processed deep-frozen foods are always stable regardless of who unfreezes them. Such food products are qualified as Universal Design Food (UDF) products, designed by the Japan Care Food Conference based on care recipients' ability to bite and swallow foods.



Torotito Mini Ganmo (UDF category 1)

Ajinomoto



What Singapore can learn from Japan:

Introduce Nursing Care Food (NCF)

- Promote NCF concept to manufacturers, retailers and general consumers
- Sale of Japanese NCF
- Develop NCF in Singapore
 - Suitable for local taste + dietary habits

Consumers – Lifestyle

Japan and Singapore:

- ✓ Fast-paced lifestyle
- ✓ Easy-to-prepare food
- ✓ Demand for high standard of living

	Japan (2014)	Singapore (2014)
Human development index (HDI)	0.891	0.912

HDI = an index for standard of life, with consideration to lifespan, education, GDP etc.
(0 = lowest, 1 = highest)

Orchard Road
shopping area



Neighbourhood
shopping mall



Consumers – Lifestyle

Japan:

- Traditional products made modern

Yoshinoya

Traditional food
→ Fast food concept



Ajinomoto

Shaving dried bonito
→ Quick dashi



- Complete retail experience
- Cater to different lifestyles and needs

AEON Mall



What Singapore can learn from Japan:

Innovation and creativity

- Technology and SOP to improve service
- Product development
- Retail experience

→ meet consumers' diverse needs and lifestyles



ACKNOWLEDGMENTS

感謝

ありがとうございました!

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Uchida



Tour guides
& translators



東京農業大学

TOKYO UNIVERSITY OF AGRICULTURE

Student guides

New friends from the various ASEAN
universities



**The warm hospitality of the Japanese we met
in all the companies we visited and all the places we went.**