

Food Security in Singapore: A Critical Overview

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Introduction

The Republic of Singapore is an island that lies just below the Malay Peninsula and received independence from the United Kingdom on 3rd June 1959. Since then, Singapore has grown to be among the forefront of developed countries in Asia and the world despite being the third smallest in Asia (Worlddata.info, 2022), as a highly developed country, ranked at 21 for best education system (World Population Review, 2022), and one of the most connected and technologically literate countries in the world (International Trade Administration, 2022). It's also considered Asia's infrastructure hub, particularly in the area of financial services (Reuters, 2022) and new businesses (McKinsey Digital, 2022). With a population of 5.9 million as of August 2022 (Worldometer, 2022), the island nation is notable for lacking any useful natural resources (Trade Chakra, 2008), as a city state, and is dependent on oil and natural gas imports for mobility and electricity generation, bolstered by an open economy with few trade barriers and robust geopolitical and global relationships (EDB Singapore, 2017). In terms of food, Singapore imports over 90% of its food requirements from over 170 countries in the world (CNBC, 2022), as it does not have sufficient land areas to engage in large-scale farming activities. Nevertheless, the Government of Singapore continually embarks on initiatives to improve Singapore's self-sufficiency with food, as with the most recent '30 by 30' food production target.

The Poultry and Egg Industry in Singapore

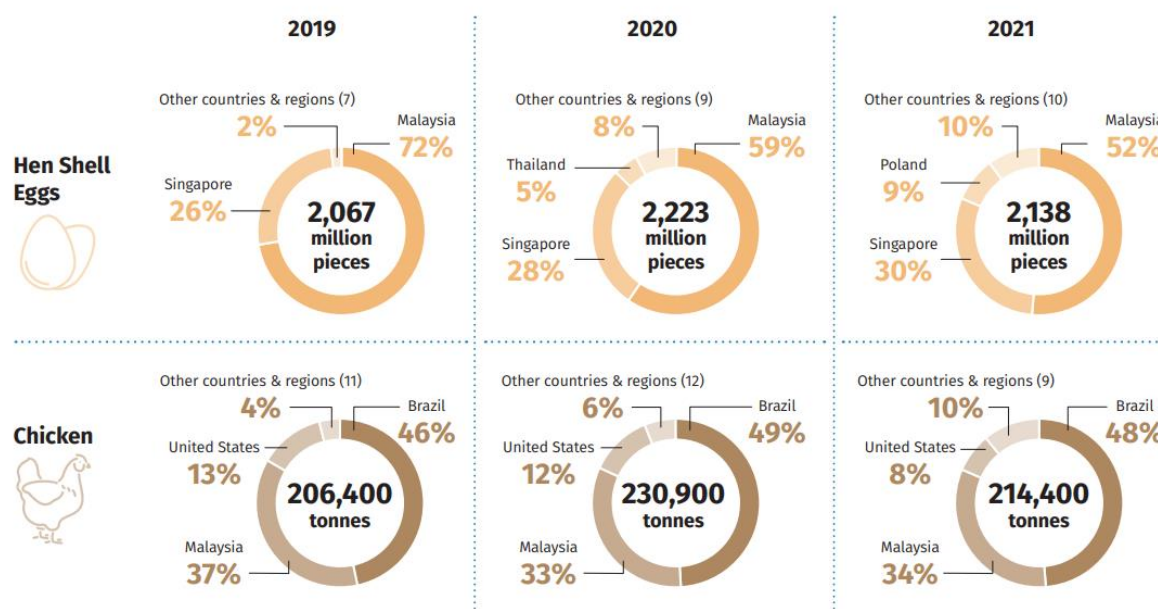
As Singapore does not have suitable tracts of land for agriculture, the country's poultry and egg requirements are fulfilled through a mix of local production and importation from neighbouring countries, particularly in terms of eggs, and fully imported in terms of poultry.

The country's egg industry is booming, as Singaporeans have a per capita egg consumption of 388 eggs per year, which is on the higher side of global egg consumption. Three local egg farms in Singapore were able to fulfil up to 28% of local demand by 2021 (Channel News Asia, 2021), with remaining demand fulfilled by imports from neighbouring countries. However, an outbreak of disease at one of the largest egg farms in February 2022 led to a dip in local production (The Straits Times, 2022), resulting in a drop of over 40% over the farm's daily production of 600,000 eggs, and necessitating increased imports to meet the shortfall.

The poultry industry in Singapore comprises of chicken, duck, turkey, goose and pigeon, and chicken is the dominant poultry import (Singapore Food Agency, 2022). This industry is fully import-dependent, as Singapore does not have any local poultry farms, and does not plan to open any in the future due to several reasons, including lack of space for traditional poultry farming (Ramanee, Singapore Has No Plans To Produce Chicken Locally, 2022). The industry historically imported 99% of its live and chilled chicken requirements from Malaysia (Zhixuan, 2022), but only 34% of its frozen chicken requirements.

However, because of Malaysia's chicken import ban, the import landscape, as well as fresh, chilled, and frozen proportions have vastly changed, as have consumer tastes and demands.

Figure 1. Singapore's supply of eggs and chicken from top sources



(Source: Singapore Food Agency)

Market Outlook

As highlighted previously, Singaporeans are an egg-loving populace, with a consumption of 388 eggs per person per year in 2020, up from 307 in 2011 (Singapore Food Agency, 2022). This has prevailed despite egg prices showing an increase, particularly in 2022 due to rising feed prices, logistics, and overall global inflation (Heng & Lee, 2022), and it is not envisioned for Singaporeans to change their affinity towards eggs in the future. Therefore, the demand for eggs will sustain at current levels at the very least.

In terms of poultry, primarily focusing on chicken, the average Singaporean consumed 36kg in 2020, up from 33kg in 2011, with an up-and-down trend observed throughout the years, as traditionally, Singaporeans have preferred fresh or chilled chicken, in contrast to the easier to transport frozen chicken (Chan, 2022). 99% of Singapore's fresh and chilled chicken is imported from Malaysia due to proximity and ease of transportation. The result of the chicken export ban by Malaysia has resulted in a threat to Singapore's de facto national dish, Chicken Rice, as vendors of this popular meal prefer to prepare it using fresh chicken as opposed to frozen chicken (The Poultry Site, 2022). However, shoppers have indicated that they would be willing to adjust their consumer preferences and switch to frozen chicken (The Malay Mail, 2022) if market dynamics dictate it. The Government is encouraging Singaporeans to switch to frozen chicken, as well as consider alternative meat sources in response to the ban by Malaysia on chicken exports.

Malaysia's Chicken Export Ban and Singapore's Response

Malaysia banned the export of chicken from 1st June 2022, with Prime Minister Ismail Sabri attributing the ban towards ensuring local food security of chicken (Andres, 2022). This was because Malaysia faced a myriad of issues that affected local availability of chicken, including declining local production figures that were attributed towards rising feed prices, outbreaks of disease, weather, and cartel effects (Paulo, 2022).

However, the ban was negatively received by Malaysian chicken producers, many of whom feared permanently losing the lucrative Singapore chicken market which Malaysia has traditionally been a mainstay, and major player in (Bedi, 2022). This was in response to Singapore approving the import of chicken from its next closest neighbour, Indonesia, in a bid to stabilize its own chicken imports and food security (Cheng, 2022). Singapore is already developing a longer-term relationship with Indonesia for chicken imports and has planned to import more Indonesian frozen chicken in August and September (Ramanee, Singapore to receive more chicken from Indonesia, 2022) to meet local demand. Vietnam has also identified and is exploring the possibility of supplying frozen chicken to Singapore (Thu, 2022). Meanwhile, imports of chilled chicken into Singapore from Australia and Thailand were increased, as were options to import frozen chicken from Brazil and Argentina (Ramanee, Singapore to receive more chicken from Indonesia, 2022). These have also had the side effect of improving political relations between Singapore and these countries further.

Malaysia is expected to lift the ban by 31st August, citing a slight oversupply of chicken in the local market since the ban was enforced even though the country has only said that they will remove farmer subsidies (Malaysia to end subsidies for chicken farmers on Aug 31: Minister, 2022), but Singapore has already recognized the threat of relying on one country for such a critical food, and commenced seeking out alternatives from neighbouring countries. Thus, Singapore may not be as reliant on Malaysia for chicken supplies as in the pre-ban era, further placing strain on a political relationship that was already under strain due to the ban.

Singapore's Strengthening of Agritech and Local Farm Development

In the meantime, Singapore's Government is embarking on ambitious plans to promote local agritech and farm development. This is in line with the Government's 30 by 30 policy, which is aimed at strengthening food security of the island nation, by setting an ambitious goal of building up local agricultural industries to produce 30% of Singapore's nutritional needs by 2030 (Singapore Food Agency, 2022). Towards this goal, the Singapore Food Agency (SFA) has inaugurated several support schemes, including a SG\$ 60 million (US\$ 43.7 million as of August 2022) Agri-Food Cluster Transformation Fund to provide financial support to farms for building and expanding production facilities (Singapore Food Agency, 2022), and the SFA has also awarded over SG\$ 23 million (US\$ 16.8 million) to 12 projects under the grant call of Research and Development in Sustainable Food Production.

Towards achieving local production with limited land space for traditional sprawl-type farming, Singapore has turned towards vertical farming, a concept that is gaining popularity in the dense urban cities of Asia. The country has started turning unutilized rooftop spaces into usable agricultural real estate, including the rooftops of public buildings such as Housing Development Board (HDB) car parks (Nelson, 2021). Indoor structures for vertical farming are under development as well, including locally created infrastructure such as aluminium towers up to nine metres tall, with as many as 38 tiers bearing

troughs for vegetables to be grown in. Each tower is highly efficient, consuming only 60 watts of electricity per day (Seneviratne, 2012).

Promoting Local Production of Alternative Proteins

Another new industry gaining traction is the alternative protein industry is rapidly gaining traction worldwide, as alternatives to animal-based proteins.

Alternative proteins comprise plant-based alternatives to meat, as well as lab-grown cultures (University of Melbourne, 2022). Singapore was already gearing up in the alternative protein space well prior to the Malaysian chicken export ban and was identified as a potential candidate for Asia's hub in alternative protein in August 2021 (Minh, 2021). The Nanyang Technological University (NTU) in collaboration with The Good Food Institute Asia Pacific, a non-profit debuted Asia's first university course is focusing on alternative proteins in this regard.

The Malaysian chicken export ban only served as a booster for the Singaporean alternative protein market, with a wide variety of alternative proteins already on the market, including lab-grown chicken meat cultivated from animal cells by a local biotechnology firm Eco Astor. This was facilitated by Singapore being the first country in the world to approve sales of cultivated meat products in December 2020 (EDB Singapore, 2022).

Singapore is even looking at cell-cultured seafood alternatives as well, utilizing 3D printing technology as a way of conserving marine life and habitats, while creating a robust buffer against supply-side shortages (Ramanee, 2022, July 15). In terms of plant-based alternative proteins, ventures such as Temasek-Cremer recently commenced plant-based protein manufacturing facilities in Singapore, fostering local production of plant-based alternative proteins (Ramanee, 2022, July 22). As a result of this, the prices of plant-based proteins have dropped by 15% (Tan, 2022), increasing accessibility, as well as availability of what was once an expensive and hard to find commodity.

Surprisingly, Singaporeans are seemingly accepting of alternative proteins, despite challenges in distribution (Mulia, 2021). They also face the issue of creating alternative proteins that can closely match the taste and texture of the seafood, poultry, and meat that they are setting out to replace. This in addition to ensuring affordability and accessibility (Razali, 2022).

Thus, the use of alternative proteins in processed foods such as chicken nuggets and burger patties offers a better avenue to acceptance (Enterprise Singapore, 2021), than as an alternative to raw meat for preparation, where taste and texture can be harder to match.

Conclusion

The export ban on poultry from Malaysia threw a spanner in Singapore's carefully crafted plans on food security. Prior to this, it was Covid-19 that ran shock waves through its import supply chain. These continuous disruptions have shown Singapore that it needs to be more agile in its planning. Alternative meats and rooftop gardens may not be able to fill the vacuum for food in every category. Singapore will still need to depend on a diverse list of importers and a resilient supply chain network to ensure its food security. In the meantime, the state will have to encourage its citizens to waste less food, thus removing the need for more.

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