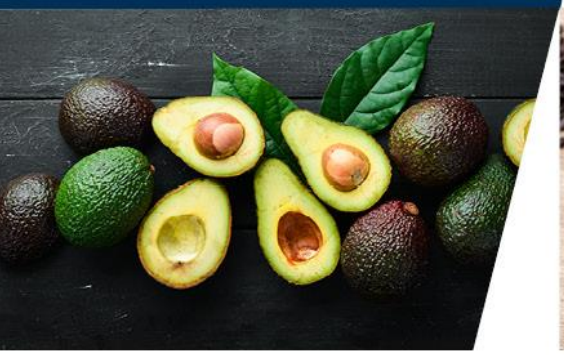

Cambodia–Australia Agricultural Value Chain Program (CAVAC)

Cambodian Crops with Prospects for the EU and RCEP Markets

Market Research Study 2022

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Author: Bastiaan Bijl Consultancy GMBH, on behalf of CAVAC

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Contents

Acronyms

ASEAN	Association of Southeast Asian Nations
EU	European Union
RGC	Royal Government of Cambodia
MAFF	Ministry of Agriculture, Forestry and Fisheries
GDA	General Directorate of Agriculture
CAVAC	Cambodia-Australia Agricultural Value Chain Program
FAO	Food and Agriculture Organization of the United Nations
WHO	World Health Organization
UNECE	United Nations Economic Commission for Europe
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
CBI	Centre for Promotion of Imports from Developing Countries of the Netherlands
DTI	Department of Trade and Industry of the Philippines
GMO	Genetically Modified Organism
GSCP	Global Social Compliance Program
GLOBALGAP	Global Good Agricultural Practices Standard
HACCP	Hazard Analysis and Critical Control Points
IFS	International Featured Standards (Food Safety Certification Scheme)
BRC	British Retail Consortium (Food Safety Certification Scheme)
SQF	Safe Quality Food (Certification Scheme)
FSSC22000	Foundation Food Safety System Certification
GRASP	GLOBALGAP Risk Assessment on Social Practice
SIFAV	Sustainability Initiative Fruit and Vegetables
GI	Geographical Indicator
GI	Glycemic Index
FSANZ	Food Standards Australia New Zealand
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China
RASSF	European Commission's Rapid Alert System for Food and Feed
FTA	Free Trade Agreement
LDC	Least Developed Country
FAOSTAT	Food and Agriculture Organization's Statistics Database
INC	International Nuts and Dried Fruit Council
RCN	Raw Cashew Nut
CN	Cashew Nut (processed: shelled)
KR	Keo Romeat (Cambodian mango variety)
YAAD	Yunnan Avocado Agriculture Development

Foreword – UPDATE

Australia has supported the Cambodian agriculture sector for over 25 years. The Australian Government's current agriculture program, the Cambodia-Australia Agricultural Value Chain Program (CAVAC), began in 2010.

For much of that time, CAVAC's focus has been on smallholder productivity in order to contribute to rural poverty reduction. However, much has changed since CAVAC was designed. Overall growth has been strong, and the structure of the economy has changed significantly with the emergence of the tourism, garments, and construction industries. This has meant that agriculture has come to represent a much smaller percentage of the economy; agriculture employment dropped from 58.2 per cent in 2003, to 36.4 percent in 2016.

As this transformation has progressed, the Royal Government of Cambodia (RGC) has affirmed its goal to achieve upper-middle-income country status by 2030, and high-income country status by 2050. These are ambitious targets and will require the RGC to maintain aggressive growth-oriented policies.

The agriculture sector has an important role to play in meeting these targets, including through increasing agricultural exports. For its part, CAVAC has strengthened its focus on supporting the competitiveness of commercial agriculture, recognising the contribution this will make to both sustainable and inclusive economic growth.

Agriculture must not only continue to increase productivity, but also to produce more high value items so that Cambodia can compete effectively. It is well recognised that Cambodia is generally unable to compete with its neighbours on the basis of volume and economies of scale, so it must have a keen sense of the market niches in which it can prosper.

CAVAC began a broad dialogue to better understand the implications of this challenge, recognising the many different policy dimensions of competitiveness. CAVAC has built on its longstanding relationship with the Ministry of Agriculture, Forestry and Fisheries (MAFF) by also engaging with the Ministry of Commerce, the Ministry of Economy and Finance, and the Council for the Development of Cambodia. CAVAC observed that different institutions and policy documents prioritised different crops to be developed, within the framework of crop diversification, to strengthen Cambodia's competitiveness.

Thus, after much discussion (including with industry), CAVAC proposed to undertake a detailed study to identify crops with high potential for both domestic and export markets.

Many previous value chain studies have focused solely on production. However, CAVAC assessed that if the objective is to increase competitiveness, then the demand side should be the starting point for analysis.

Understanding demand requires data such as global market size and growth potential, consumer preferences for particular varieties, Sanitary and Phytosanitary Measures and other non-tariff barriers to trade, product utilisation (fresh or processed), key competitors and potential windows of opportunity. It was also decided that the study should focus on key markets such as the European Union (EU), China, the Association of Southeast Asian Nations (ASEAN), Australia and New Zealand.

Understanding these factors - and how to exploit them - should generate long-term benefits for Cambodian agriculture. For example, while Cambodia may pride itself on the tasty Keo Romeat mango variety, this is unknown in key markets where varieties such as Alphonso, Keitt and Tommy Atkins dominate international trade. Market analysis will identify both the opportunities and obstacles in this scenario.

Thus, this study was commissioned in order to provide stakeholders – various ministries within government, industry actors, and the development partner community – with a rigorous information base from which to continue to develop policy and market strategies.

In February 2020, CAVAC engaged the services of a well-known consultant within the region and began consultations with both the public and the private sector. Following extensive discussion, a shortlist of 30 potential crops was drawn up for further study. After applying a set of criteria (production volumes in Cambodia sufficiently large to make an impact, cold chain requirements, competition, value, etc.) nine

crops with good potential were retained. These included two crops that are less well known in Cambodia but for which there is a growing international demand (avocado and sweet potato).

CAVAC is proud to present the study to its intended audience of policymakers and private sector stakeholders. Indeed, the study has several areas of application. It can assist policymakers to make informed choices about matters including trade policy and facilitation, quality standards, and investment promotion. It provides analysis of specific opportunities that industry can exploit. It also provides an example of the value of systematic approaches to market intelligence.

We hope that the study will contribute to the making of informed choices that will lay the basis for a growing participation in international trade by the Cambodian agricultural sector while contributing to employment and poverty reduction.

May 2020, CAVAC – UPDATE

Executive Summary

Why was the study conducted and what value does it offer?

CAVAC is a program funded by the Australian Government. The overarching goal is to promote a commercially viable, resilient agriculture sector supporting inclusive growth.

CAVAC focuses on promoting high value products for domestic and export markets with the aim of enhancing competitiveness and longer-term profitability and growth. CAVAC works with the government and the private sector to contribute to better policies and practices with the aim to improve productivity, enhance product quality and promote trade in high value products.

CAVAC commissioned this study with the objective to establish a list of export crops with good potential for Cambodia and to acquire detailed insights into the features of demand in the chosen markets. The study will inform the strategic approach for CAVAC in terms of suitable crops and ensure better alignment with global market demand. The study provides recommendations to the government, private sector and development partners on what they could do to realise export or expanded export of these products. It should also trigger more awareness for the need to gather and analyse market intelligence to support decision-making and to adopt a more pro-active approach to developing crops for export and rendering Cambodia more competitive.

Which are the crops with the most promising prospects and how were they selected?

The nine selected export crops with promising prospects were shortlisted from a significantly longer list by filtering data through a series of criteria that are measures of competitiveness. Selection criteria included aspects such as Cambodian production and export performance, global demand performance, scope for regional integration, options for market and product diversification, potential to reach a wider farming community and perishability. Prior knowledge about markets also counted – markets for crops like rice have been studied intensely already, the large-scale starch producers in Cambodia also carry all the intimate knowledge about how their maize and cassava should be supplied, as well as known global starch markets.

The author of the study stressed the importance of also including in the list some forward-thinking innovative crops that may not yet be well established in Cambodia but that offer great potential in global markets. Products like avocado and macadamia have been global winners for decades. They are in very strong demand driven by powerful marketing campaigns. Seeking these kinds of **winning crops for Cambodia's future** should also be a key part of a **strategic and innovative approach**.

The crops selected were:

- Mango
- Dried banana chips
- Longan
- Avocado
- Cashew
- Sweet Potato
- Chilies
- Sesame
- Palm Sugar

Some remarkable market movements in markets analysed as well as the key driving forces shaping the dynamics across these markets

Fresh mango

Cambodia is accomplishing much success with mango - achieving sizeable exportable quantities of good quality - and is making new in-roads into markets like South Korea. The country has also now gained access to the Chinese market but imports are moving only at a sluggish pace, probably because of unplanned variety/market matching.

The dried mango sector is also growing rapidly with new processing facilities being established.

The focus of fresh and dried mango exports is very much on the Keo Romeat variety. The General Directorate of Agriculture (GDA), within the Ministry of Agriculture, Forestry and Fisheries (MAFF), has tested a wider range of international mango varieties and approved a list suitable for cultivation in Cambodia including Keitt, R2E2 and Irwin.

The European supply of fresh mango is becoming a well-oiled logistics machine expanding to close to 800,000 tons of imports in 2021. Sales have been boosted by in-market ripening to offer fruit that is ready-to-eat. Kent and Keitt are the two varieties that are best suited for the Ready-to-Eat chain. At the same time, European consumers are appreciating taste and are ready to try a wider range of mango varieties, like the Nam Doc Mai grown in Thailand. There could be an opportunity to introduce Keo Romeat as a niche, speciality product. Season-wise the calendar window for Cambodia is favourable in Europe as it does not coincide with the calendar windows of the mega suppliers – Peru and Brazil - that flood the market during their seasons. GLOBALGAP or CAMGAP certification is essential to most buyers of fresh produce in Europe. It is early days in respect of the adoption of Good Agricultural Practices (GAP) and this will need urgent attention to speed it up.

China's market is expanding rapidly as consumers have more to spend and are becoming increasingly health-conscious. Fresh-fruit sales online have become a major feature of the Chinese market. Chinese consumers have a strong preference for a larger fruit with orange flesh and a red blush on the skin. The Australian variety R2E2 appears to match Chinese consumer preference and is, therefore, the focus of most of the Thai, Vietnamese and Australian supply. R2E2 is also one of the varieties that the GDA has tested as being suitable for growing in Cambodia. A few small producers in Cambodia have already responded to this and have succeeded in producing fruit of excellent quality: Cambodian grown R2E2 are starting to appear in Phnom Penh supermarkets, and the country should consider taking up this variety in a bigger way.

Within ASEAN, Singapore is the main mango market reaching US$25.5m of imports in 2021. Australia and Thailand are the main suppliers. R2E2, Calypso and Kent are popular varieties. The Singaporean consumer is not very concerned about mango colour.

Japanese and Korean consumers lean more towards Irwin, which is also one of the varieties that MAFF has confirmed as suitable to grow in Cambodia. The Philippines leads the way in adopting this variety for export production within ASEAN.

Dried fruit and purée – mango, banana and longan

Currently, Cambodian mango drying, both sugar infused and natural, is becoming well established. A large player from the Philippines has also set up in Cambodia, attracted by the cheap supply of raw material. Also relating to dried mango, Cambodia should seize the opportunity to widen the range of varieties, to offer a slightly wider assortment of taste, colour and texture. Keitt, for example, is well suited for drying and may fruit at a different time to KR, thereby extending the drying season. Buyers of dried fruit and nuts are also likely to look to add a wider range of fruit beyond simply dried mango, such as dried banana, dried pineapple and dried papaya for dried fruit mixes. These supply chains also need strengthening for the dried mango exporters to succeed.

The European market for dried mango is not exceptional in size due to a lack of awareness, and issues surrounding seasonality, which restricts its use in the food industry, such as for breakfast cereals. The purée market is significantly larger. The Middle East market for mango purée is five times larger - an additional option for Cambodia to consider in dealing with the glut of fresh mangoes in the short KR season. Thailand

is a decent sized exporter of mango purée. With the right incentives the Thai industry may be enticed to help kick-start purée production in Cambodia.

In China, dried mango and banana are popular snacks sold in bricks-and-mortar retail stores and on the internet. Imports of dried mango have increased ten-fold in the last ten years. Chinese interest in mango juice is, however, very limited. The Philippines is a key supplier of both dried mango and dried banana to the Chinese market. In recent times the Philippines has experienced boom and bust years in terms of banana harvests, and, during bust years, the dried chips business has been heavily affected since raw material prices rise too high to compete. In the same way as this has driven a Philippine mango drier to invest in facilities for production in, and export from, Cambodia, the banana chipping industry can be encouraged with the right investor incentives.

China is a big market for dried and fresh longan. Hong Kong seeks more canned, and Indonesia only fresh. So, in short, China is *the* market for dried; it is a traditional gift during Chinese New Year and is also very popular in terms of internet sales. From Cambodia's perspective, approval to supply dried longan to China is likely to be more easily acquired and to come earlier than it would for fresh. The growing location, however, is not the same, so mango dryers would need to set up additional drying facilities that were closer to where longan is grown.

Growing health-awareness, and the search for convenience, is driving an increase in popularity for the consumption of longer-preserved fruit in Japan in the form of frozen (avocado and mango) and dried (mango and banana).

Sweet potato

Cambodia produces 20,000 MT of sweet potato but has never approached the crop as a serious contender for export because work would be required to improve varieties to meet requirements in terms of quality and quantity. GLOBALGAP or CAMGAP certification is crucial for most buyers of fresh produce in Europe, and now the Thai Food and Drug Administration has also made it fully compulsory for Thai imports (border trade can circumvent this, but not sustainably in the long run). GAP standards for sweet potato are not yet available for Cambodia and will need urgent attention to speed adoption among sweet potato producers.

Two market blocs are eager for sweet potato – Europe and ASEAN. In Europe, demand has been surging (from 200,000 MT to 400,000 MT in five years) driven by a well-timed US campaign (Europe's leading supplier). Sweet potatoes became instantly popular with European consumers seeking healthier alternatives and something with more taste and colour than regular potatoes, which are the common staple food in most European countries.

The ASEAN market is on a different scale, merely surpassing 80,000 MT in 2021, but has shown some rapid dynamism in recent years. Thailand, Singapore and Malaysia are the main markets. Vietnam has emerged as the main supplier to the region. Apart from achieving exportable quality standards, Vietnam has also successfully managed to produce and export the Japanese sweet potato with its purple skin and pale-yellow flesh, which is appreciated as a premium sweet potato in ASEAN.

Avocado

A relatively new, but innovative, crop for Cambodia, with significant export potential, is avocado. This has already been enjoying increasing global popularity for two decades. Demand keeps growing in Europe, with imports reaching close to 1 million MT, and also in China. The world cannot produce enough of the highly nutritious and healthy fruit. The Hass variety is preferred for multiple reasons including its hard skin, which makes it highly suitable for shipping and handling. This is also the variety that is recommended for adoption by Cambodia.

A major booster of sales has been in-market-ripening for read-to-eat convenience. This has boosted sales of the fruit in China and similarly in Singapore. At the same time, China has been planting avocado intensively and expects a large harvest from 2022 onwards: this will change the dynamics of the Chinese market, although consumption is likely to keep climbing, necessitating continuous imports. Competition is currently mainly from South American suppliers.

A key hurdle for Cambodia to overcome is the requirement for GLOBALGAP certification to access European markets. This deserves attention as exportable quality volumes are developed, which will also help in acquiring approval to access the Chinese market.

Avocado is also very popular in Japan and South Korea, and is prized for its many health benefits.

Sesame

Sesame is not a totally new product for Cambodia, which produces just over 10,000 MT annually and exports a small quantity of black sesame. White and other lighter-coloured sesame seeds are common in Europe, the Americas, West Asia, and the Indian subcontinent. The black and darker-coloured sesame seeds are produced mostly in China and Southeast Asia. In Myanmar and China, white sesame is being increasingly cultivated in response to rising demand. Some farmers have already caught on to this, have started white sesame production, and are currently exporting unofficially to Vietnam.

Among the six market blocs covered in this report, China is the largest. That country is itself also a producer and exporter. But to meet its massive demand, and to compensate for its declining production, it has been importing up to 930,000 MT annually. It mainly imports for the production of sesame oil, but convenience foods, bakery and cosmetics are also fast-growing sectors. Chinese demand for organic produce is strong, and growing faster than it is among the country's conventional counterparts, in particular for the sesame oil and cosmetics sectors.

Japan is the third largest sesame seed market in the world after China and Turkey. The country's sesame imports have particularly focused on sesame as feedstock for its roasted sesame oil production, but it is also widely present in Japanese cuisine as roasted seeds.

Sesame in Europe is especially consumed by bakeries and for ethnic/Mediterranean foods. For this reason, Germany and Greece are major markets. Similarly, Australia has citizens who are of German, Greek and Chinese origin, and they influence the consumption of sesame and sesame-based products. Products like humus and tahini are becoming mainstream across Europe, as is the use of sesame in dishes that are healthy, and/or vegetarian. Europe's bakery segment offers opportunities for organic sesame. India is a leading supplier to Europe, with a focus primarily on white sesame.

In ASEAN, Vietnam, Thailand and Malaysia are importing significant amounts of sesame for direct consumption and for application in their sesame oil, bakery, fast food, health snacks and confectionary industries. In Thailand it is also in demand for the cosmetics sector.

Palm sugar

Cambodia's experience in respect of palm sugar exports has been a great success thanks to the coordination of small producers. The result has been the production of an export quality product along with additional Geographical Indication (GI) status for palm sugar from Kampong Speu. The sector does, however, face constraints particularly in the availability of labour for harvesting palm juice as young people increasingly prefer urban jobs. There is still scope, however, for further investment in production skills and infrastructure, as well as in expanding the reach of producers and connecting them to the export value chain.

Although palm and coconut sugar differ in terms of production, the final product is similar and consumers in various markets are unaware of the difference. 'Coconut sugar' is better known and often the two names are combined into `coconut palm sugar'. On the whole, though, there is still limited awareness, and consumers are still learning about the product. The two markets studied were Europe and Australia/New Zealand. Product awareness is still quite low, but those who are aware tend to be higher-end consumers who are, for instance, prepared to pay a premium for organic or GI palm sugar from Kampong Speu. As awareness increases, however, the question of how palm/coconut sugar will fare against other alternative sweeteners such as stevia and erythritol, remains. It is important to note that stevia does have a bitterness that palm sugar does not.

Chilies

Cambodia produces fresh chilies in the west of the country, close to Thailand, and dried chilies, known as 'bird's eye' chilies, in the east. Some orders from Italy have been fulfilled. However, cultivation methods need to be improved and CAVAC has developed some model chili growing fields to provide training. Key markets exist in Europe and ASEAN. Thailand has seen a strong rise in the production of food products like sauces, curry pastes and ready-made meals and has rapidly increased its imports of dried chilies. Malaysia also offers a sizeable market for fresh chilies, which reflects the Malaysian preference for using these for cooking. The country is able to meet only 37 per cent of demand with its own production and consequently imports over 60,000 tons of fresh chilies each year. The main source has been Vietnam which is facing issues with exceeding MRL (maximum residue levels) in respect of pesticides.

The European market for chilies is sizeable and expanding, given their use for seasoning and in the food industry. Buyers tend to be large and consequently buy large quantities and seek a supply that is uniform according to various parameters, such as in hotness on the Scofield scale. They also seek good management of microbial properties to allay concerns about issues including Salmonella, E.coli and aflatoxins. Interest in fresh chilies is also growing.

Cashew nuts

Cashew nuts constitute a big export sector for Cambodia but the country loses out when it comes to value addition as it exports the nut only in its shell. In recent years, however, processing machinery has become more accessible and several processors have become established in Cambodia opening up new avenues for the country to explore markets for shelled cashews. It is a timely moment as buying markets have started to feel uneasy about their dependence on a single source (Vietnam) and have increasing concerns about sustainability. As Vietnam imports raw cashew from many sources, some from West Africa, traceability and carbon footprint have also become major challenges.

Cashews are the most popular tree nut in Europe, replacing several other nuts that are more difficult to come by such as walnuts, almonds and pistachios. Direct nut consumption as a healthy snack is the most common form, but it is also available in other forms – such as cashew nut butter – as healthy and vegetarian lifestyles become more popular. Organic cashew nuts command a healthy premium and demand is greater than can be met by the current supply: an interesting option for Cambodia to pursue as, with cashews, there is no corresponding loss in yield. The scenario in Australia/NZ is quite similar, although these countries have an even higher dependence on Vietnam as their supplier – close to 99 per cent of the market.

Cashews are traditionally not the most favoured nut of the Chinese, where the preference is more for almonds and pecans. Cashews have, nevertheless, benefited from the massive expansion in healthy snack consumption with a significant boost in online sales. The Chinese cashew supply is very closely tied to Vietnam through informal channels which must now become more formalised. Cambodia will need to find ways to distinguish itself from Vietnam in shelled nuts. As China becomes increasingly concerned about traceability and carbon footprints, these aspects might offer Cambodia leverage. However, meanwhile, Cambodia will need to ensure that it is operating efficiently to offer a competitive price in order to combat the highly efficient large-scale Vietnamese players.

Japanese and Korean consumers have become more health-conscious and better educated about the nutritional benefits of consuming edible tree nuts. Although almonds and walnuts are preferred, cashews are also in demand especially as a mixed nut snack.

Recommended policy interventions

Based on the findings about markets and trends the report also includes a short Chapter including some recommendations on logical policy interventions in response to insights relating to international demand. These recommendations range from acquiring market access, to improving market relevance, investment promotion, facilitating improved competitiveness and strengthening brand image.

1 Introduction

CAVAC focuses on the agriculture sector through the promotion of high-value products for domestic and export markets. CAVAC works with the government and the private sector to contribute to better policy and practices to improve productivity and enhance product quality, and supports the government to promote trade in high-value products.

CAVAC undertook this study to arrive at a list of crops with the best export prospects and to conduct market research on trends, characteristics, competition and requirements of the markets for the selected crops. CAVAC may wish in the future to expand beyond its initial focus of selected markets, which includes those in which Cambodia has preferential access, namely the EU, ASEAN and China, Japan and South Korea.

Besides the insights and recommendations that emerge from this study, CAVAC's further purpose is to:

- Inform its own strategic approach for suitable crops and to achieve alignment with global market demand.
- Initiate the road towards the development of a market intelligence platform for strategic use by ministries and the private sector.
- Give recommendations to the government, private sector and development partners about what they should do to initiate exports or to expand exports of these products.

The scope of this study should be well noted. The main emphasis is to analyse international demand. A clearer beacon of where to aim will enable initial recommendations to be made. It is, however, not within the scope of this study to give all the answers and fully-fledged strategies for each export crop. The findings of this study are intended rather to feed into more detailed work with selected crop stakeholders to be completed in the future.

The flow diagram below illustrates the scope of the study once more. The focus is on the identification of crops with promising prospects and thereafter the study of international demand for these crops. Following a demand-driven approach, insights can in the future provide a demand roadmap for export strategies. However, the more detailed strategies to follow and actions to be pursued by these crop sub-sectors fall outside of the scope of this study. For that, a much more detailed analysis of the supply side and coordination and collaboration with sub-sector stakeholders would be required. This is not to say that the supply side was ignored by this study. On the contrary, a good snapshot was required for (a) crop selection and (b) to give a clear context for studying international demand.

This report outlines the selection and then goes into detail for each of the product and market combinations. In order to make navigation reasonably user-friendly and certain topics not too repetitive, in some areas certain crops have been amalgamated, and legal market requirements, a rather cumbersome topic, has been dealt with in an entirely separate Annex covering all crops and markets.

The selection of crops with promising prospects included in this study is not a one-off. As more and more information is gathered, the selection shifts. As a result, two selected crops were dropped late in the process. While this may seem disappointing, it should be noted that gathering intelligence to confirm that prospects are not promising is as valuable as the contrary, in which promising prospects are confirmed. In other words, the avoidance of going down the wrong path is also an important outcome.

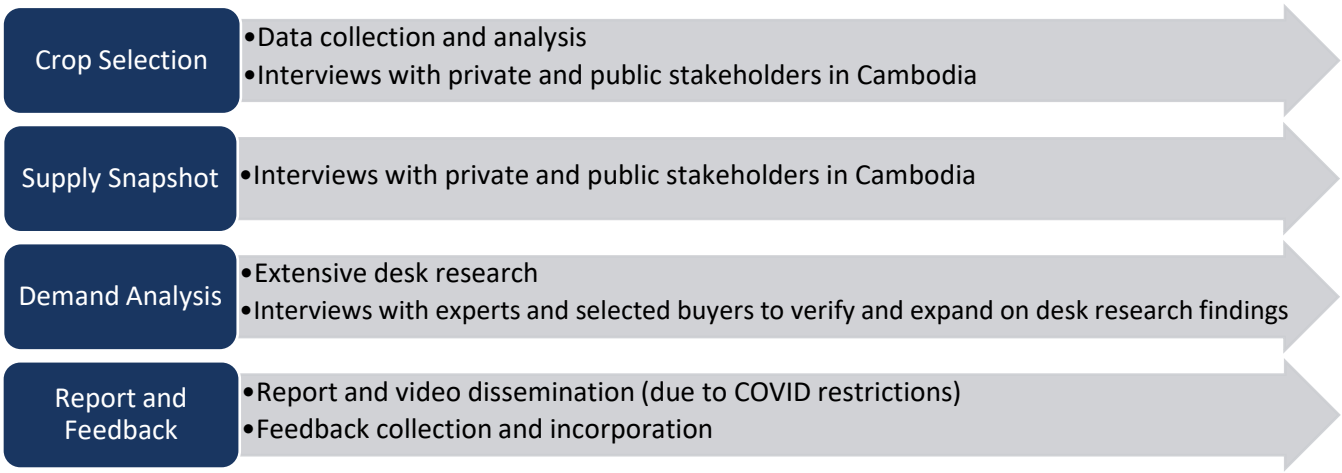
Various recommendations are made in this report (shown as **Recommendations**). The author felt it more useful to keep the recommendations within the Chapters rather than separately distanced from the depth of detail in specific product/market combination Chapters. Nevertheless, a synthesis of recommendations has also been put together in Chapter 11.

Legal market requirements connected to food law can also be very lengthy and complex. To simplify matters, and as mentioned above, this study deals with these in a separate Annex and has taken the approach of showing

the regulations in more of a guide table structure with many pinpointed links to more information and guides available on the web.

2 Crop Selection and Study Methodology

2.1 Study methodology



With the ever-increasing availability of information on the internet today, a big component of the research on international demand has needed to include extensive online desk research combining online databases for quantitative data and many other sources for complementing qualitative data. The very extensive literature list in the Annex is testament to the extent of desk research carried out.

Analysing demand, however, cannot be conducted in a vacuum and has little purpose if it is not given a clear context – in this case, some knowledge about the situation on the ground relating to the capacity and potential of the supply side. Beyond context, meetings with stakeholders also responded to the need to engage policymaking stakeholders (government and development agencies) and to make sure that the report was reasonably aligned with their priorities. Stakeholders who contributed to this study covered all the crops in the report, as much as possible, as well as the crops that were borderline cases for selection.

Views about which crops to select were also collected from the private and public stakeholders prior to the final crop selection.

2.2 Crop selection

In the guidelines for this study, CAVAC sought ten crops with promising prospects to be studied. While it did set the markets to be studied – Europe, ASEAN, China, Japan, South Korea and Australia/New Zealand – it did not fully define which products it considered to be offering promising prospects. This was intentionally in line with the bigger aim to initiate a process of strategic intelligence-gathering to support a better-informed policy approach to promoting more innovative approaches to cash crop exports. The process starts with the selection of crops with promising prospects for export using a series of criteria that deem them to be promising. This, however, should be an ongoing process and should not stop with this study.

Continuing from earlier groundwork initiated by CAVAC, a set of filter criteria was applied to a longer list of Cambodian export crops including the following:

- Current amount of production (cut-off minimum at 10,000 MT)
- Production growth
- Exports
- Export growth
- International demand in the form of:
  - Global market size, and market and price growth
- Scope for regional integration (untapped demand within ASEAN)
- Potential for product and market diversification
- Product perishability (considering cold chain facilities are very limited)

- Potential to reach a wider farming community[1]
- Level of existing market knowledge[2]

Besides these competitive dimensions, the author also stressed the importance of including in the list of crops with prospects some forward-thinking innovative items that may not yet be well established in Cambodia, but that offer great potential in global markets. Products like avocado and macadamia have been global winners for some time. They have been in strong demand, driven by powerful marketing campaigns. In the case of avocado, world suppliers simply cannot produce enough. Seeking these kinds of winning crops for Cambodia's future should also be a key part of a strategic and innovative approach instead of continuously hitting a brick wall by promoting traditional crops that offer more challenges than prospects. It was decided, together with CAVAC's export team, to include one or two of these in the list. The concept also resounded well with various stakeholders such as the GDA. It should be noted that this approach meant that some of the filters listed above were not applied – such as the 10,000 MT minimum production level – as these innovative crops are not yet well established in Cambodia.

The value of monitoring through market intelligence gathering is illustrated by the case of macadamia, the first of the two crops that had to be dropped from the selection later in the process. This high value nut has been sought by markets for decades and recently created excitement with an unprecedented surge of demand from China.[3] Such trends illustrate the reasons for this to be a winning, innovative crop to promote in Cambodia while new cuttings are being planted. The nut is native to Australia and has been successfully grown in the higher altitude plateaus in East and Southern Africa and Hawaii. Thailand has, however, in recent years been successful in growing the nut in northern provinces such as Chiang Rai. Further success has been achieved by adding additional value to the nut with innovative packaging and processing.

China has also 'strategically' caught on to the high prospects presented by the nut and planted such large areas that, in a few years, it will start to produce nuts (macadamia takes seven years to begin producing nuts, a few less if grafted): it will soon challenge the entire global market. According to the International Nuts and Dried Fruit Council (INC), China is expected to become the world's leading macadamia nut producer by 2022, with an estimated production volume of 190,000 tons compared with the current total of 18,000 tons, which will account for about half of global production.

Although it is true that the luxury nut will attract more interest among Chinese snack eaters and can be expected to continue to grow in popularity, further expansion of demand is not likely to outrun the massive expansion in production.

Monitoring these kinds of developments is, therefore, a key activity for policymaking bodies in Cambodia, also for non-traditional crops with high prospects: first of all to spot them and second to monitor their potential based on developments around the world.

The ten crops selected for inclusion in this study are:

- Mango
- Avocado
- Longan
- Dried banana (chips) (replaced macadamia)
- Chilies
- Cashew
- Sweet Potato
- Palm Sugar
- Moringa
- Sesame

At a very late stage, despite international expert advice that sticking to high quality and organic produce will guarantee a leading position in the market for moringa, it was discovered that there is real oversupply in the market and demand is simply not sufficiently consistent.

1 **One or two large plantations would be a very narrow beneficiary audience.**

2 **Markets for main crops like rice have been studied in great detail already. Propensity for import substitution was dropped as a criterion when it appeared that most of the crops that passed through the other filters were not those that were substantially imported.**

3 **China holds more market potential for macadamias than any other country on the planet, recording an 11-fold increase in consumption since 2012. Its power as a market was driven initially by e-commerce, and, more recently, the Chinese government's advice to eat nuts daily as part of its increased focus on improving the health of its citizens (Australianmacadamias.org).**

Table 1 Crops that were considered with reasons for non-selection

Reason for non-selection	Crops
Production too small	▪ **pomelo** ▪ **lemon** ▪ **dragon fruit** ▪ **ginger**
Too perishable for undeveloped cold chain	▪ **guava** ▪ **custard apple**
Limited commercialisation of the crop	▪ **groundnuts**
Hard to compete with large-scale and highly advanced neighbours	▪ **durian** ▪ **pineapple**
Very large-scale commodity – Cambodia too small	▪ **palm oil** ▪ **soya bean**
Cambodia still at a very primary level of processing	▪ **rubber**
Only large-scale, foreign company, one market	▪ **coconut products** ▪ **fresh banana**
Declining world market and spiralling prices of conventional non-organic, non-GI niche	▪ **pepper**
Highly chemical dependent and harvested by hand	▪ **mung bean**
Starch industry already knows the market well	▪ **cassava** ▪ **maize**
Not enough dynamism in international demand	▪ **cocoa bean**
Already well studied and monitored	▪ **rice**

The selected list of crops with promising prospects evaluated against the four markets appears in Table 2 below indicating a more specific focus in ASEAN and detailing non-fits where a product/market combination does not exist. Green implies a product/market match, grey a non-match with an explanation. In the case of ASEAN the individual markets are specified.

Table 2 Crops considered to be non-fits where product / market combination does not exist

Crop	Processed forms	EU	ASEAN	China	Australia/New Zealand	Japan	Korea
Mango	Fresh, dried, purée		SNG, MLY		Only a small market for dried, tough to compete with Thailand which dominates the market		
Avocado	Fresh		SNG, MLY		NZ: Bio-security = no imports AUS: season = no match		
Longan	Fresh, dried	Unknown fruit	IDN, VNM, THA re-export to China		Unknown fruit	Unknown fruit	Unknown fruit
Cashew	Shelled, unshelled		VNM, THA		95+% dominated by Vietnam		
Banana-chips	Freeze dried, baked, fried		SNG		Very small market		No data
Sweet potato	Fresh		SNG THA	Major exporter	Small quantities, dominated by Thailand	Major exporter	Protected market
Chilies	Fresh, dried fruit, powder/ flakes		THA, MLY, IDN	Major exporter	Very small market		Protected market and heavily dominated by China
Palm sugar	(organic) granules		Only IDN for ketjap manis, too large-scale	With volume limitations, better to stick to high value markets		Limited information	No information
Sesame	Seed						Protected market

3 Fresh Mango

3.1 Product definition

Mangifera indica, grown in sub-tropical and tropical regions including Cambodia, comes in a wide range of varieties that require specific soil and climatic conditions. Markets around the world also differ in their preference for varieties.

In Cambodia, the pre-dominant variety is the Keo Romeat, which is on the large side, yellow skinned with deep orange flesh, medium to low fibrosity, mild aromatic flavour with reasonably high sweetness.

The General Directorate of Agriculture (of MAFF) has just completed three-year trials of imported varieties and has approved the suitability of the Cambodian climate and soils for:

- Guire #82
- Tainon #1
- R2E2
- Keitt
- Irwin
- Shan Lin
- Yuwin #6
- Three Years
- Jinh Wang, Xishi
- Red Golden Dragon
- Renong #1
- Narcissus Mango
- Sensation

So far, one large farm in Cambodia is reported to have planted a range of these new varieties, and R2E2 is gradually being adopted by a few innovation leaders. In Europe the following varieties are popular: Tommy Atkins, Kent, Keitt, Palmer and Haden. In China, R2E2 is prized for its red blush. In Japan and South Korea, Irwin is the most popular.

While there is no doubt that the Keo Romeath is liked in Korea, Cambodians also need to be aware that other international varieties may be more easily recognised (and preferred – e.g., European consumers prefer mangoes with very little fibrosity). Also, offering a variety may enhance appeal among international buyers. Significant, too, is the fact that different varieties vary slightly in 'time for harvest', which can be beneficial in supporting fresh produce management, especially with such a short main season for KR. For example, in South Africa, Tommy Atkins ripens earlier in the season (around October/November) and Keitt and Kent come much later (toward February/March).

Table 3 Top varieties of mango produced per country

Country	Country Top Varieties Produced
Thailand	**Nam Dok Mai, Brahman, Okrong, R2E2**
Mexico	**Tommy Atkins, Haden, Manila, Kent, Keitt, Manzanillo Nuñez, Ataulfo, Irwin, and Diplomatico**
Brazil	**Tommy Atkins, Haden, Palmer, Keitt**
Peru	**Kent, Haden, Tommy Atkins**
India	**Alphonso, Banganpalli, Chausa, Langra, Totapuri, Benishan, and Kesar.**
Philippines	**Carabao**
Pakistan	**Chaunsa, Dasheri, Alphonso**
Australia	**Keitt, Kensington Pride and Honey Gold**
Vietnam	**Cat Chu, Hoa Loc, R2E2**

3.1.1 Offering a diversity of dried fruit

The Cambodian main market season is short, leaving limited time for export handling of fresh mangoes amidst a flood of incoming harvest. While some exporters are starting to assess how to prolong the season

by making use of refrigerated storage, another important option is to increase the processing of the fruit. Drying is, therefore, increasing rapidly in Cambodia. Some important tips are listed below.

Buyers seek variety in various forms:

- Sugar infused/no sugar added (health snack)/organic.
- Chips/strips/bits.
- Mango species variety brings out different levels of sponginess, chewiness, colour – recommended varieties are Kent, Keitt, and Tommy Atkins, in addition to KR.
- Sun-dried/machine-dried/freeze-dried (the latter is most applicable for powder, breakfast cereals etc., but the technology is expensive).
- A variety of dried fruits – they may stop buying if you cannot offer a range of fruits beyond mango since buyers usually supply multi dried fruits – e.g., to the breakfast cereal industry or to mixed fruit and nut brands. Banana, pineapple and papaya are the leading additional dried fruits sought in such an assortment. If Cambodia aspires to grow its dried mango industry further, it must take this detail into consideration by strengthening its supply of other fruits – also in large enough volumes to make prices affordable. Dried fruit exporters have pointed out that the 'honey' variety of pineapple, which is good for drying, is often too expensive and that the banana supply is too unreliable.

Westfalia is a leading supplier of dried mangoes from South and West Africa. To illustrate the best practice of offering a range of varieties and of dried fruit, the company's offering is described below:

Dried fruit: Westfalia's dried mango is prepared from sound, choice-grade, succulent, ripened fresh fruit that has been washed, peeled, de-stoned and cut to the desired size, then dried in an optimally-controlled hygienic environment to provide the best possible food safety. No sugar is added. Dried mango is low in saturated fat and sodium and contains potassium. Cultivars used include Tommy Atkins, Kent, Keitt, Lippens, Amelie, Brooks and Ataulfo mangoes, which usually originate from South Africa, West Africa, Kenya or Mexico. Westfalia offers preserved and unpreserved options, as well as organic and/or Fairtrade certified dried mango. Other dried produce available from Westphalia includes dried strawberries, raspberries, banana, apples, pineapples, coconut and kale.

Source: https://www.westfaliafruit.com/wp-content/uploads/2019/05/Westfalia-Sustainability-Story-May-2019.pdf

There are three main types of dried mangoes:

- Sugar-infused or crystallised mango pieces made by soaking the fruit in a mixture of water and sugar, and then drying it. The final product retains a fairly soft consistency but loses a large part of its flavour and is high in added sugar.
- Conventional tray-dried with the addition of preservatives to extend shelf-life. Thanks to a residual moisture content of 14 to 18 per cent, the dried product retains some softness, without the stickiness often criticised in this type of dried fruit. The mango flavours and aromas remain more intense than they do in the crystallised fruits.
- Organic sold under the 'organic' label (organically grown with no added preservatives), generally produced using a more or less artisanal processing technique. These products have an often heterogeneous quality in terms of shape and colouration, as well as a limited shelf-life.

3.1.2 Mango purée is also an important element to consider in the diversification mix

Production of mango purée is also being considered by some pioneer investors in Cambodia. The important consideration in the costing calculation is the need to keep the plant operational all year round. The good news is that fruit pulping machines can cater for many different fruits including banana (good demand for baby food), pineapple, guava (in demand as a filler for many juices), watermelon, tomato (also convertible to concentrated purée), lychee and papaya, so seasons can be stretched.

3.1.3 Other dried fruits

This Chapter also covers two other dried fruits – dried/fried banana chips and dried longan - as follows:

Dimocarpus longan, commonly known as the 'longan', is a tropical tree species that produces edible fruit. It is one of the better-known tropical members of the soapberry family (*Sapindaceae*), to which the lychee, rambutan, guarana, korlan, pitomba, guinep and ackee also belong. The fruit of the longan is similar to that of the lychee, but is less aromatic in taste. It is native to Southeast Asia. The longan (from Cantonese *lùhng-ngáahn*, literally 'dragon eye'), is so named because it resembles an eyeball when its fruit is shelled.

Banana chips are dried slices of banana. They can be covered with sugar or honey and have a sweet taste, or they can be fried in oil and spiced or slated. Freeze-dried banana slices are also increasingly appearing on the market.

Table 4 Trade data classification

Location	Code	Label	Side note
MANGO – FRESH/DRIED			
	080450	**Fresh or dried guavas, mangoes and mangosteens**	
EU	**08045000**	**Same as HS6 code.**	**Since EU imports of guavas and mangosteen are miniscule we can assume the code generally represents mangoes. However, dried and fresh are indistinguishable within this code**
Thailand	**08045020001** **08045020002**	**Fresh mangoes** **Dried mangoes**	
Philippines	**08045020**	**Mangoes**	**Separate code for mango since 2017**
Indonesia	**0804502000**	**Mangoes**	
Vietnam	**080450**	**Fresh or dried guavas, mangoes and mangosteens**	**Mangosteens are a very important export/import product in Vietnam – so the combined mango/mangosteen code makes trade flows difficult to analyse**
China	**08045020**	**Mangoes, fresh or dried**	
Australia	**08045050**	**Fresh or dried guavas, mangoes and mangosteens**	**Australia has separate codes for fresh mangoes and dried mangoes, but they are not used to record trade flows**
New Zealand	**0804500001**	**Fruit, edible; guavas, mangoes and mangosteens, fresh**	
	0804500009	**Fruit, edible; guavas, mangoes and mangosteens, dried**	
MANGO PUREE			
EU	**20079993**	**Mango purée concentrate, obtained by cooking the genus *Mangifera* spp., with a sugar content by weight of not more than 30 per cent, for use in the manufacture of food and drink industry products and other tropical fruit**	
	20089948	**Mango purée: not from concentrate, of the genus *Mangifera*, with a Brix value of 14 or more – but not more than 20 – used in the drinks industry and in the manufacturing of other tropical fruit products**	
FROZEN MANGO			
EU	**08119085**	**Frozen tropical fruits and nuts – mainly mango, non-sweetened**	
	08119011	**Frozen tropical fruits and nuts – mainly mango, non-sweetened (sugar content >13%)**	

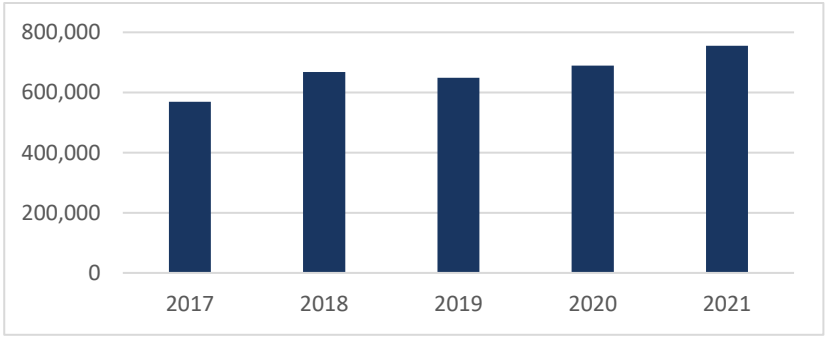
Location	Code	Label	Side note
Japan	**081190220**	**Frozen tropical fruits and nuts, excluding pineapple, including avocado**	
LONGAN – fresh/dried			
China	**08109030**	**Fresh longan**	
	08134010	**Dried longan and pulps**	
ASEAN	**08109010**	**Fresh longan**	
	08134010	**Dried longan**	
DRIED BANANA			
EU	**08039090**	**Bananas, dried (excluding plantains)**	
Other countries	**080390**	**Fresh or dried bananas (excluding plantains)**	

3.2 Mango – Europe

3.2.1 European market opportunities and insights for fresh mango

Fresh mango consumption in Europe has grown substantially. In recent years imports of the fruit have expanded at a phenomenal rate – from 400,000 MT in 2014 to close to over a 1 million tons in 2021 – facilitated by an ever-increasing, efficient supply chain including in-market ripening. Mango has now reached 12th place in the 25 most imported fruits in Europe.[4] *Per capita* consumption is roughly 1.5 kg reaching a similar consumption rate in the US of 3.17 pounds (1.47kg) (Statista).

Figure 1 Leading European (EU + UK) imports of mango, 2017-21 (tons)



Source: Trade Map

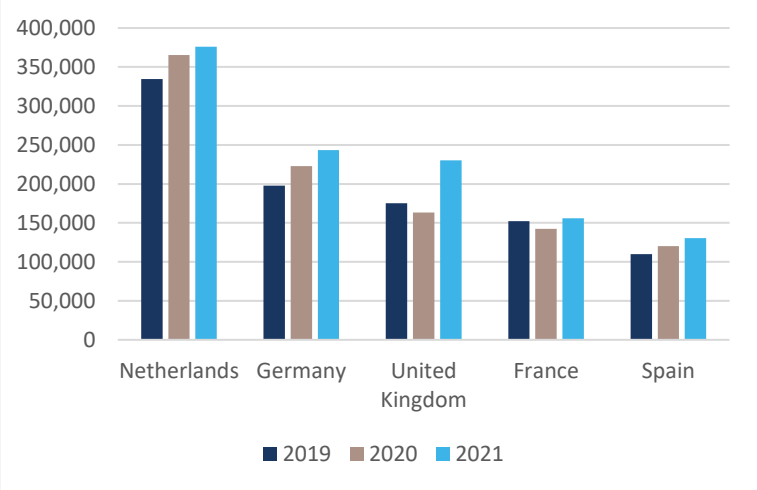
[4] **This data also includes intra-EU imports.**

Table 5 Top 25 fruits imported into Europe (EU + UK)

	US$ million 2021	CAGR 2017-21
Fresh or dried bananas	6,733.3	0.6%
Fresh grapes	3,926.6	4.1%
Fresh or dried avocados	3,503.7	11.3%
Fresh or dried oranges	2,597.6	0.6%
Fresh or dried almonds, shelled	2,436.6	0.1%
Fresh apples	2,435.0	-1.1%
Fresh cranberries, bilberries	2,402.5	19.4%
Fresh or dried lemons and limes	2,008.1	2.2%
Fresh kiwifruit	1,900.8	9.0%
Frozen fruit	1,687.3	7.6%
Fresh strawberries	1,665.7	6.2%
Fresh raspberries, blackberries, mulberries and loganberries	1,657.3	14.2%
Fresh peaches, incl. nectarines	1,519.3	1.7%
Fresh or dried guavas, mangoes and mangosteens	1,477.4	8.0%
Fresh or dried clementines	1,396.4	2.7%
Frozen raspberries, blackberries, mulberries, loganberries	1,184.5	13.6%
Fresh watermelons	1,171.8	8.4%
Fresh pears	1,165.1	0.9%
Fresh or dried mandarins	1,128.3	11.2%
Fresh or dried pineapples	1,072.6	-2.4%
Fresh tamarinds, cashew apples, jackfruit, lychees, passion fruit, etc.	962.1	4.9%
Fresh melons	958.7	-1.7%
Dried grapes	749.9	0.3%
Frozen strawberries	622.6	4.0%
Fresh cherries	614.0	5.7%

Source: Trade Map

Figure 2 Leading Importers of mango in Europe (EU + UK) (US$'000)



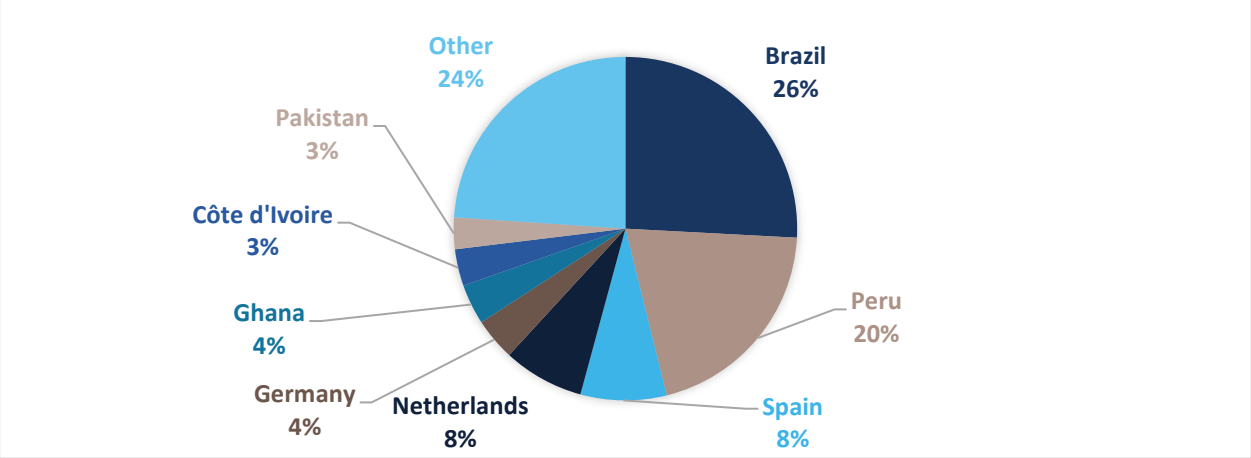
Source: Trade Map

Germany, the United Kingdom and France are the leading markets for fresh mango. The Netherlands plays an important role as a re-distribution hub for fresh mangoes; almost half of its exports go on to other

markets. Spain is both a producer and exporter and importer/re-exporter (owing to its traditional ties with Latin America), exporting mainly to France and Portugal. Growth can be witnessed across the leading markets, however, this is less so in France.

Markets in Eastern Europe are mainly supplied from Western European sources like the Netherlands. Although consumption is significantly less, it is also growing rapidly.

Figure 3 Leading suppliers of mango to Europe (EU + UK), 2021



Source: Trade Map

Brazil and Peru have become Europe's mega suppliers (though this is seasonal – see below). Combined West African suppliers are also important, and also have the benefit of being closer to the market with a reduced carbon footprint and an increased possibility to supply via air freight to niche markets off-season. As previously mentioned, Spain is not only an importing market within Europe but also an important producer and exporter to France and Portugal.

3.2.1 Diversity of fresh mango varieties across seasons

Between May and November, the European market is mainly supplied by Brazil, Côte d'Ivoire and Israel. Brazil produces the Keitt, Kent and Tommy Atkins varieties, and its production of Palmer mangoes is increasing. Peru steps in during the European winter, mainly supplying Kent mangoes, alongside other smaller varieties such as Haden and Ataulfo. There is also a niche market for special varieties, such as the Nan Dok Mai from Thailand/Vietnam and the Alphonso from India.

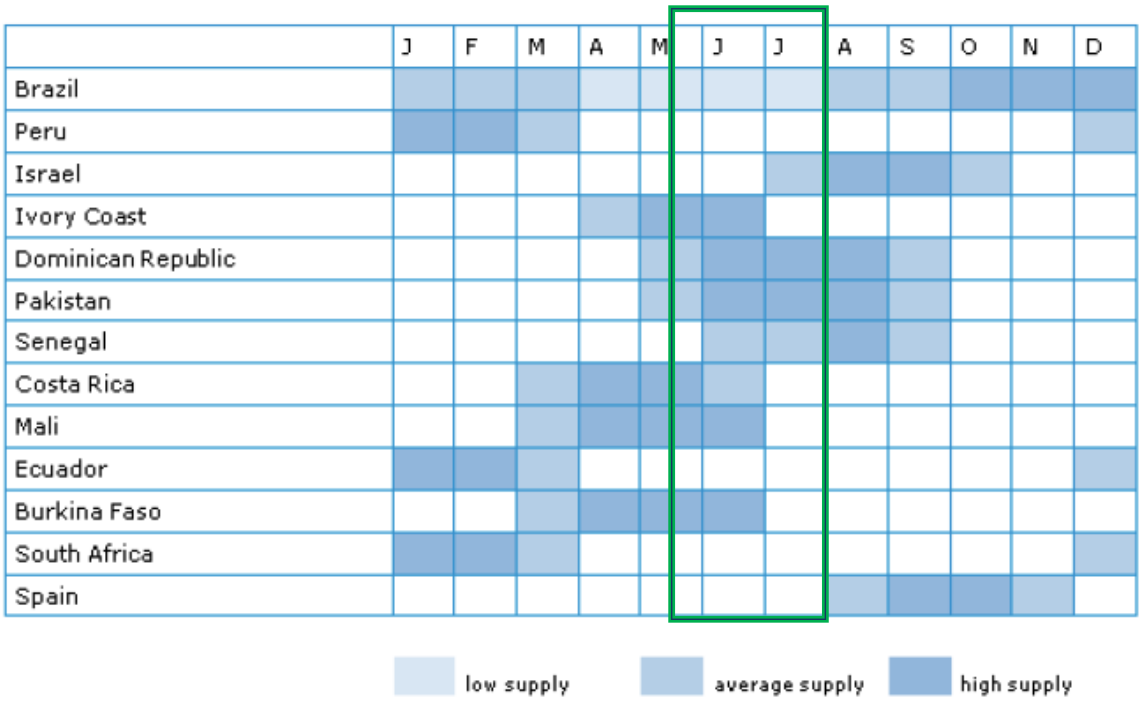
Recommendation: Keo Romeat is totally unknown as a variety in Europe. It would need to be positioned as a niche product. However, it may be too fibrous for the European consumer. Cambodian chances may be better with Keitt, which has been confirmed as suitable to grow in Cambodia.

The supply calendar in Table 6 below shows approximate time of year that the EU market is supplied from various sources. (Cambodia's supply window is indicated by the green box.) Although Cambodia would enter this market with a minuscule supply compared with other sources, the main Cambodian season and time to market would not fall at the same time as that of the Peruvian supply, and during a time of low-supply for Brazil. These two suppliers are colossal and tend to flood the market during their peak seasons.

Cambodia's main supply window coincides with supply mainly from the Dominican Republic, West Africa and Pakistan.

European traders are trying to organise year-round supply. The weak points are usually at the beginning or end of seasons when the fruit quality is not optimal for ripening or is at risk of being overripe. Traders are open to alternative suppliers during these times, creating opportunities for exporters who are able to supply good quality mangoes when other countries cannot.

Table 6 Supply Windows



Source: CBI

3.2.2 European fresh mango market trends

Ripened and ready-to-eat

Ripened mango has become a major part of retail demand in recent years, particularly in Northern Europe but spreading beyond. The ripening process has been perfected with the aim to boost consumption as consumers are more likely to buy a fruit that is directly ready for consumption. Mango ripening is performed by several importing companies. The Keitt and Kent varieties are most suitable because of the specific transport and ripening conditions required.

Recommendation: This constitutes a good reason for Cambodia to consider Keitt for the European market.

Interest in a broadening range of varieties

The European consumer used to consider colour and size to be particularly significant, but, as they have become more familiar with the fruit over the years, taste has become more important. People are learning to appreciate taste and now prefer to spend more on a high-quality product. With this comes interest in a wider range of varieties. In recent years, new varieties such as Keitt, and more exotic varieties such as Nam Doc Mai, have arrived on the market. Consumers have embraced this diversification because the new varieties offer better taste, sweetness and are fibreless.

Recommendation: Perhaps this is an opportune time for a Cambodian variety with a unique story behind it.

Growing interest in sustainable fruit production

Environmental and social issues are becoming increasingly important. Certification schemes that are in line with the Global Social Compliance Programme (GSCP) are more likely to be accepted by European supermarkets.[5]

Opportunities for organic mangoes

The organic segment in Europe is increasing annually. Scandinavian countries and Germany in particular are purchasing much more organic produce, including organic mangoes. It is, however, said that mangoes are

[5] **See https://www.oecd.org/daf/inv/mne/45634152.pdf**

one of the most challenging fruits to grow and certify as organic, so Cambodian producers may need to focus on the naturalness and low-use of chemicals without specific organic certification.

3.2.3 Mango standards

General marketing, quality and packaging standards

The marketing standards for mango in Europe are not EU legal directives as is the case for kiwis or apples, for example. The entire industry, however, adheres to the standards for mango formulated by Codex Alimentarius and the United Nations Economic Commission for Europe (UNECE).

Fresh mango

The UNECE standard for fresh mango specifies various classes of mango, but, in all cases, a minimum requirement applies. The mangoes must be:

- intact
- fresh in appearance
- practically free from pests
- free from marked bruising
- free from abnormal external moisture
- free from any foreign smell and/or taste
- clean, practically free from any visible foreign matter
- sound – produce affected by rotting or deterioration such as to make it unfit for consumption, is excluded
- free from damage caused by low temperature
- free from damage caused by pests affecting the flesh
- free from black stains or trails which extend under the skin

The development and condition of the mangoes must be such as to enable them to:

- withstand transportation and handling
- arrive in a satisfactory condition at the place of destination.

The development and state of maturity of the mangoes must be such as to enable them to continue the ripening process and to reach a satisfactory degree of ripeness. The website giving further details on classes, sizes, origin marking, packaging etc., appears in the footnote below.[6]

Dried mango

UNECE has defined a marketing standard for dried mango specifying that the product must be presented either as halves, sliced or in pieces. It lays out minimum requirements that dried mangoes must be:

- intact (only for halves): however, edges that are slightly torn, slight superficial damage and slight scratches are not considered as a defect
- sound: produce affected by rotting or deterioration such as to make it unfit for human consumption is excluded
- clean, practically free from any visible foreign matter
- sufficiently developed
- free from living pests whatever their stage of development
- free from damage caused by pests – including the presence of dead insects and/or mites, their debris or excreta – free from blemishes, areas of discolouration or spread stains in pronounced contrast with the rest of the produce affecting in aggregate more than 20 per cent of the surface of the produce
- free from mould filaments visible to the naked eye
- free from fermentation
- free from abnormal external moisture
- free from foreign smell and/or taste except for a slight salty taste of sodium chloride and/or calcium chloride or a slight sour taste of citric acid and a slight smell of preservatives/additives, including sulphur dioxide.

The condition of the dried mangoes must be such as to enable them to withstand transportation and handling to arrive in a satisfactory condition at the destination. Moisture content is an additional key aspect of the standard.[7]

Private standards – common requirements

Food safety is a primary concern and, as such, most buyers, whose aim is to reassure their customers, are likely to request additional guarantees relating to legal requirements in the form of certification. The most commonly requested certification for mango is GLOBALGAP which covers practices at the pre-farm-gate level. As this is essential for most supermarket chains, it is largely unavoidable, even though it is not a legal requirement to enter the market. The insistence on GLOBALGAP certification is, however, dependent on the location within Europe: in Southern and Eastern Europe it is less of an absolute priority.

Recommendation: A major priority for Cambodian mango producers is adoption of the Good Agricultural Practices Standard (CamGAP) – as, in Cambodia, this is still slow and in an early stage of adoption by producers and exporters. The approach for tapping into the European markets is to adopt and certify Good Agriculture Practices. In the process of achieving this, mangoes can already be exported to Europe in markets that are less strictly insistent on GLOBALGAP certification.[8]

6 Read the full standard at: http://www.unece.org/fileadmin/DAM/trade/agr/standard/standard/fresh/FFV-Std/English/45_Mangoes.pdf

7 Refer to the full standard at http://www.unece.org/fileadmin/DAM/trade/agr/standard/dry/dry_e/DDP25_DriedMangoes_2013_e.pdf

8 Meanwhile, the Vietnamese mango sector is surging ahead with VietGAP certification of some of its mango production gearing up for export to the European market.

Food safety management systems (post-farm-gate), that are frequently requested and well recognised, that go beyond simply adhering to HACCP (hazard analysis and critical control points) principles, include IFC, BRC, SQF, and FSSC22000. These safety management systems focus primarily on processes, hence are sought more often for processed mango – dried, frozen, purée – and less so for fresh table fruit. In fact, for processed fruit, Global GAP is less of a requirement. The Philippines is a case in point. The country is known to have challenges with acquiring GLOBALGAP certification across the board and has, therefore, made a strategic decision to focus on processed rather than fresh for its mangoes and bananas.

Private standards – niche requirements

Requirements for niche customers include organic certification and suchlike. The market for organic mangoes is relatively small, but demand is growing and the supply is still limited. Note, however, that in order to market organic products in Europe, organic production methods, according to European legislation, must be used, and an organic certificate with an accredited certifier must be secured. Implementing GRASP (GLOBALGAP Risk Assessment on Social Practice) provides a good basic social certification. GRASP is part of GLOBALGAP and is gaining in importance.[9]

As another good option, standards recognised by the Sustainability Initiative Fruit and Vegetables (SIFAV) can be implemented. This initiative from traders and retailers indicated a determination to become 100 per cent sustainable in sourcing from Latin America, Africa and Asia by 2020.[10]

A few specialised buyers provide extra opportunities for socially-certified products: schemes include Fair for Life or Fairtrade. In general, however, Fairtrade certification is losing importance in Europe for fruit, although less so for purée.

3.2.4 Tariffs and prices

Table 7 Mango – tariff advantages in Europe

Code	Tariff	Regime	Exporting Country
080450 (mango, mangosteen, guava)	**0.0%**	**MFN**	**All supply countries**

Source: Market Access Map

The EU market has a fully open policy for the supply of mangoes applying no tariffs or quotas. There is, therefore, no specific market access advantage for Cambodian supplies of fresh or dried fruit.

Table 8 Netherlands average mango CIF prices Euro/kg

Average Netherlands CIF prices for mango (US$/kg)

	2019	2020	2021
World	1.43	1.38	1.28
Brazil	1.33	1.13	1.10
Peru	1.38	1.44	1.30
Côte d'Ivoire	1.25	1.35	1.17
Dominican Republic	1.89	1.08	1.04
Germany	1.25	2.18	1.96
Burkina Faso	2.58	3.26	3.72
Spain	1.91	2.09	1.86

9 https://www.globalgap.org/uk_en/for-producers/globalg.a.p.-add-on/grasp/index.html

10 https://www.idhsustainabletrade.com/resource/sifav-basket-standards/

Senegal	1.45	1.31	1.15

Source: Trade Map

3.2.5 European trade fairs and importers

Table 9 Mango – European trade fairs

Fresh	Dried	Purée
Fruit Logistica Biofach ANUGA SIAL	Food Ingredients Europe Biofach Fruit Logistica SIAL Fruit Attraction ANUGA	Food Ingredients Europe Fruit Logistica Biofach SIAL ANUGA

Table 10 Prospective importers

Importer	Website	Type
Yex BV	www.discovered.nl	Exotic fruits
Greenyard Fresh NV	www.greenyard.group	Fresh and dried exotic fruits
Special Fruit NV	www.specialfruit.com	Mango
Capespan Continent NV	www.capespan.com	Mango
Bakker Barendrecht	www.bakkerbarendrecht.nl	Mango
Roveg	www.roveg.nl	
McGarlet Srl	http://www.mcgarlet.it/en	Mango, fresh, dried and fresh-cut
Nature's Pride BV	www.naturespride.eu	Mango
Bratzler & Co. GmbH	www.bratzler.com/en	Mango
Total Produce	www.totalproduce.com	Mango
Torres Tropical / Jan Stap BV	www.torrestropical.com	Mango
Minor, Weir & Willis Ltd	www.mww.co.uk	Mango
Tropical Direct Ltd.	www.tropicaldirect.co.uk	Mango
Greencell Ltd.	www.greencell.com	Mango
Port International	http://www.port-international.de/en	Mango
WISHA – SATORI	www.wisha.ch	Fresh and dried mangoes

3.3 Fresh mango – China

3.2.6 Opportunities and insights for fresh mango in China

Table 11 China's imports of mango and leading suppliers 2017-21, tons

	2017	2018	2019	2020	2021
World	**5,125.9**	**10,914.1**	**14,485.0**	**84,137.4**	**14,498.1**
Thailand	837.8	4,958.2	8,566.1	11,711.0	5,651.3

Cambodia	0.0	0.0	10.3	24.8	3,343.5
Vietnam	226.0	2,068.8	140.5	**67,180.7**	2,694.1
Taipei, Chinese	1,830.7	2,133.5	4,797.7	3,990.7	2,050.2
Peru	1,138.5	1,337.0	623.5	614.7	350.3
Australia	970.4	227.1	163.1	452.7	242.4
Myanmar	0.0	0.0	2.1	0.0	76.6
Philippines	106.0	167.4	158.3	98.0	52.0
Pakistan	7.9	9.2	19.9	3.6	37.4

Source: Trade Map

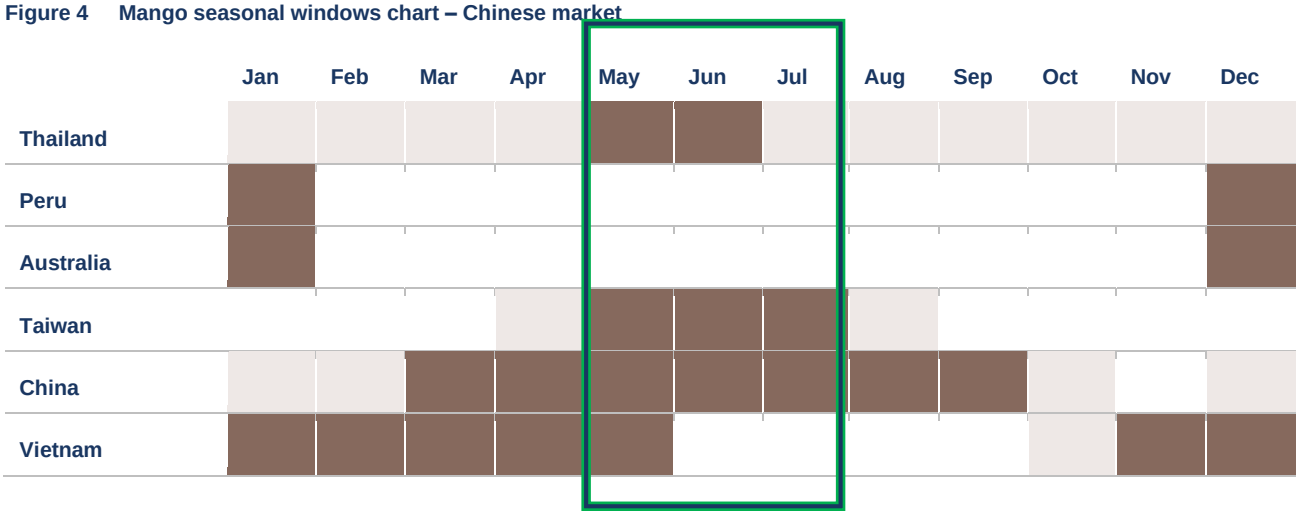
Official figures show that the Chinese mango import market is reasonably small with imports reaching 14,000 MT in 2019. Leading suppliers are Thailand, Taiwan, the Philippines and Australia. However, this does not capture the unofficial supplies that go through grey channels via Hong Kong, most importantly from Vietnam. China's import figure for 2020 confirms how imports from Vietnam were not being properly recorded. After the clamping down on inaccurate recording of Vietnamese imports in 2019, we see an addition of 67,000 MT from Vietnam.

FoodNews (Jan 2020) quotes Dong Thap, Vietnam's major, but not only, mango producing province as having 9,664 hectares under cultivation with an average yield of 11 MT per hectare, projecting output would have reached 125,000 MT in 2019. The article also indicates that 6,300 hectares in the province also produce fruit in the off-season.

Cat Chu and R2E2 are important varieties produced in Vietnam, the latter being a variant developed in Australia that has a red blush, which is an aspect that appeals to Chinese consumers. The R2E2 mango variety was introduced from Australia to Vietnam in 2003. Chinese demand for the variety has been soaring, and, in response, Vietnamese farmers have been producing more and more. The R2E2 mango has now become the most popular variety grown in central Vietnam. The R2E2 mango is generally large, at 600-900 gram/piece, and the harvest season in Vietnam for this variety is long – from October to May. Despite the fact that there is only a partial period of season overlap with Cambodia's Keo Romeath, Vietnamese producers have voiced some concern that China may soon allow fresh Cambodian mangoes to be imported. At the same time, they expect that Cambodian exporters will face more challenges with transportation. Thailand's supply to China also comprises the R2E2 variety. In addition to the supply countries mentioned above, Ecuador and Pakistan also have a foot in the door.

It is difficult to acquire a full picture of the grey trade from the official statistics. But an additional estimate by Queensland University, based on interviews with stakeholders in the Chinese mango industry, suggests that a high proportion of exports reach the Chinese market through Hong Kong grey channels. Market shares of countries supplying the Chinese market are difficult to assess in these circumstances. However, the study estimates the main proportions to be 70 per cent being local Chinese mangoes, 20 per cent Thai and Vietnamese, 7 per cent Peruvian and 2-3 per cent Australian.

Figure 4 Mango seasonal windows chart – Chinese market



Source: Trade Map and other web sources

key: high supply, low supply

Australian mangoes, also R2E2, are sold mainly from December to January in China – before the Chinese Spring Festival. This means that Australian mangoes do not compete with local products, nor with mangoes from Thailand and Vietnam. They may compete with mangoes from Peru and Ecuador, which are available during the Chinese Spring Festival.

As the world's second largest mango producing country after India, Chinese local supply of mangoes is also significant. These are pretty much available throughout the year, although the key window is March to September. This prolonged availability is a result of there being multiple growing areas across China with supply windows starting in March in Hainan and ending in September in Yunan and Guangxi. Cambodian exporters can, therefore, expect competition from China, Thailand, Vietnam (only in May) and Taiwan, but not from Australia or Peru.

As R2E2 appears to be the mango of choice for the Chinese market, the Cambodian industry will soon need to decide whether to focus on Keo Reomeat or on R2E2 for exports to China. The current slow pace of Cambodian fresh mango exports to China may be due to Chinese consumer hesitancy towards Keo Romeath. If so, the decision will be straight forward – speed-up R2E2 production for the Chinese market.

Other insights relating to the Chinese market

- Robin Roberts, of Griffith University, studied Chinese consumer preferences in respect of mango.[11] Colour, taste and ripeness proved to be the most important attributes, colour being the most important: the best mangoes were considered to be those that are yellow/orange with a red blush. The Chinese consumer prefers to purchase mangos when they are ripe, and this is determined by touch, colour and smell. A sizeable proportion of customers interviewed by Griffith believed that the mango would only taste good if it smelt good, and that, if it had no smell, it would have no taste.
- Traders at the Gangzou and Jiangnan regrade and repack according to the ratio of blush on the mango, and from there it enters the cold chain, which is not fully intact, especially not for redistribution to Tier II and Tier III cities.
- With reference only to Australian mangoes, the Queensland University study states that importers apply a class ratio of >80 per cent blush, 60-80 per cent blush and <60 per cent blush as Class I, II and III, respectively. This is followed by size counts. According to the same study, the fruit that weighs approximately 500 g is the most preferred by Chinese online retailers and premium supermarkets.
- Online retail of fresh fruit is an important channel. Online retailers frequently have well established cold chain logistic centres, and at times will purchase directly from supply countries.
- Importers and wholesalers prefer to work with only a few suppliers so that they can manage supply consistently at a larger scale.
- The situation can be expected to be different when Chinese importers source mangoes from Vietnam and Thailand. Although working with exporters or grower exporters for direct sourcing is a common practice, several importers go to the farms and buy all the fruit before the harvest. Then, they pay a packer to pack based on their requirements, or directly rent a pack house to pack by themselves. Sourcing like this can enable them to control the entire process, which reduces cost and ensures consistent quality.

Table 11 Average Chinese CIF prices for mango (US$/kg)

	2019	2020	2021
World	1.84	0.91	1.45
Thailand	1.21	1.07	1.59
Taiwan	2.32	2.05	2.21
Vietnam	0.58	0.72	0.79
Australia	3.97	6.62	7.66
Peru	4.26	3.88	4.73

[11] **'Understanding the hearts and minds of Chinese mango buyers', Robin Roberts, Griffith University, 2012**

Cambodia	1.07	2.55	0.32

Source: Trade Map

Table 13 Comparative tariff advantages

China no quota/country approvals			
0804501001 (mango, fresh)			
	15.0%	MFN	Mexico
	0.0%	China-ASEAN FTA	Cambodia & ASEAN members
	0.0%	China-ASEAN LDCs	Cambodia, Laos, Myanmar
	0.0%	China-Peru FTA	Peru
	0.0%	China-Australia FTA	Australia
	0.0%	China-Chile FTA	Chile
0804502090 (mango, dried)	15.0%	MFN	South Africa
	0.0%	China-ASEAN FTA	Cambodia, Thailand, Vietnam Philippines

Source: Market Access Map

3.3.1 Relevant Chinese trade fairs

- China Fruit and Vegetable Fair (China FVF)
- Fresh Asia Supply Chain
- IFE China
- SIAL China
- FBIE Shanghai
- ANUFOOD China
- FHC China
- Shanghai International Fruit Expo

3.3.2 Prospective buyers

Buyer	Location	Website
Jianyi Fruit (Foshan) Investment Co., Ltd.	**Foshan**	**https://panjiva.com/Jianyi-Fruit-Foshan-Investment-Co-Ltd/34832440**
Shenzhen Lihuaxin Import and Export Co., Ltd	**Shenzen**	**https://cn.panjiva.com/Shenzhen-Lihuaxin-Imp-Exp-Co-Ltd/38477333**
Berdafruit	**Guandong**	**http://www.berdafruit.com/**
Guangdong Foods V-mix Int'l Trading Co., Ltd.	**Guangzhou**	**http://www.foodsvmix.com/en/index.jsp**
Shanghai Xing Wan Fruits Co., Ltd.	**Shanghai**	**http://www.xwfruits.com/English/**
Wonong Fruit	**Shanghai**	**http://www.wonongfruit.com/en/contact-us/**
Wuxi Nongda International Trading Co.,Ltd	**Shanghai**	**http://www.ndgjmy.com/english/**

3.4 Mango – ASEAN

3.4.1 ASEAN opportunities for mango

ASEAN's leading importers of mango are Singapore and Malaysia. Data relating to the latter is, however, not entirely complete. Based on data computations and estimations, Malaysian imports in 2021 were approximated at around 75,000 MT,[12] the majority from Thailand, while Singapore imported 25,576 MT.

Table 14 Singaporean imports of fresh or dried mangoes (US$'000)

Imports / Supply Countries	2017	2018	2019	2020	2021
World	**15,163**	**17,122**	**16,211**	**19,142**	**23,862**
Thailand	**7,736**	**7,808**	**7,533**	**9,622**	**12,868**
Malaysia	**2,744**	**3,860**	**4,067**	**5,115**	**6,313**
Australia	**1,738**	**2,116**	**1,501**	**1,173**	**1,203**
India	**1,193**	**1,363**	**1,140**	**846**	**1,170**
China	**377**	**272**	**163**	**641**	**921**
Indonesia	**301**	**366**	**536**	**406**	**268**
Vietnam	**16**	**18**	**38**	**80**	**222**
Pakistan	**195**	**274**	**302**	**205**	**189**
Cambodia		**67**	**299**	**206**	**168**

Source: Trade Map

Singapore's market for mangoes has been rising steadily over recent years, although it is still relatively small. Thailand accounts for just under 40 per cent of the market, and Australia, around 25 per cent. Mangoes are one of the island nation's favourite fruit ranked in 8th place. (This import overview is a reasonably accurate representation, as Singapore does not have land to grow crops and therefore imports most produce.) Cambodia has also succeeded in initiating a supply of mango since 2018.

Table 12 Singaporean consumers' favourite fruits (Imports 2019, US$'000)

Fruit	Import value
Apples fresh	**65,138**
Grapes fresh	**49,801**
Oranges fresh	**40,266**
Strawberries fresh	**32,171**
Bananas fresh or dried	**30,922**
Tangerines fresh or dried	**25,718**
Pears fresh	**22,841**
Mangoes fresh or dried	**22,770**

Fruit	Import value
Cranberries blueberries fresh	**20,791**
Avocados fresh or dried	**19,514**
Coconuts desiccated fresh or dried	**18,819**
Kiwifruit fresh	**18,474**
Melons fresh	**16,978**
Durians fresh	**14,225**
Watermelons fresh	**14,129**

[12] Based on Thai export data

Source: Trade Map

3.4.2 ASEAN fruit trade overview – production and export of mango across the region

The Philippines

The mega producer in the region is the Philippines which also processes a significant proportion of its mangoes – particularly dried. With poor performance in cold chain management, packaging, and pre-export Sanitary and Phytosanitary Measure treatments, the Philippines has not been able to sustain a strong position in the export of fresh mango, as exporters are unable to comply with the standards required by key markets. According to the USAID/DTI Philippine Mango Value Chain Analysis, no Filipino mango producers are GAP certified. A recent search (in 2020) on GLOBALGAP's database still produced no results in respect of Philippine mangos. Leading processors have instead been able to meet good standards in manufacturing practices, such as HACCP, ISO, and NSF, with which they can access markets with stringent requirements such as the US and Europe.

The Philippines exports more processed than fresh mango. According to the same USAID/DTI Value Chain Analysis, more than 70 per cent of exports were related to puréed and dried mango, as well as to other processed mango such as mango candy.

The dried mango industry has expanded to the point where Filipino companies are internationalising in investment terms and, now, the largest – Profood, which claims to supply 50 per cent of the world's dried mango – has started to establish a processing plant in Cambodia. Through this venture the company expects to become more price competitive globally owing to the low cost of raw materials in Cambodia. The year 2019 saw a bumper crop in the Philippines as a result of an El Niño weather pattern. This resulted in a surplus of some 2 million kgs, bringing prices down (BBC, 19 June 2019). Profood International Corporation established its mango processing plant in Cambodia under Tropical Fruit Asia. The processing capacity is 4,000 tons of dried mango per season.

Vietnam

In contrast to the Philippines, Vietnam's focus is on fresh mango exports and the country is rapidly expanding VietGAP certification of mango farming practices. Farmers also increasingly apply advanced techniques to improve yield and quality, such as bagging young fruit. High yields are being achieved – of 11,000 MT/ha, compared with 8,900 MT/ha in Thailand.[13] More than 6,300 ha of orchards now fruit in the off-season. Fresh exports are expanding to the USA and Australia beyond Vietnam's traditional market, China (FoodNews, Jan 2020). Chinese import data shows imports of 67,000 MT of Vietnamese mangoes in 2020. It is believed that some of these originate from Cambodia through unofficial channels (Trade Map).

Recommendation: Vietnam has very recently made major inroads into the market in Singapore, with various crops like sweet potato, thanks to mega-supermarket chain partnerships. Although Vietnam is currently a small player in Singapore's mango market, this could change in the near future. Vietnam should, therefore, be watched closely as an upcoming competitor in the Singapore mango market.

Thailand

Thai exports amounted to US$93m of fresh and US$35m of dried mango in 2021, both on a steep upward path from 2018 - US$60m and US$19m, respectively (Trade Map). Korea and Malaysia are especially important markets for fresh Thai mangoes, while most of the dried exports go to the United States. As is evident in Table 14 above, Thailand is also Singapore's leading supplier. Although Nam Dok Mai is appreciated as an 'exotic' variety in Europe, Thai exports to Europe are comparatively small.

Thai mango purée production and export are also significant – US$39m. Thailand's mango purée capacity is important for Cambodia's institutions to take note of, with a view to attracting investment in this form of processing in the country. This would capture the flood of mangoes in the main in-season. Thailand's mango sub-sector is also well established in terms of organic certified fresh as well as dried.

13 FAOSTAT, 2018

3.4.3 Seasonal windows

With Thailand being the key supplier to Singapore as well as Malaysia, there is no seasonal advantage to be found for Cambodia.

Some additional insights in respect of Singapore's mango market acquired from a recent Queensland University study:

- There are five main varieties in the Singapore market, including R2E2, Calypso, Kent, Keitt and Kensington Pride, although those two latter varieties command only a small volume.
- Singapore importers mainly import premium and Class 1, and occasionally Class 2 fruit. Premium fruit is mostly preferred by high-end supermarkets, although some is sold to wholesale customers.
- The Singapore market generally does not have specific requirements in respect of fruit colour, although good-looking fruit without any blemishes and black spots is preferred.
- Mangoes are mainly shipped by air, but road and sea transport are used for mangoes from some Asian-Pacific countries, such as Thailand and Taiwan.
- Although Singapore has a large percentage of high-income customers willing to spend more on exotic and niche products (FreshPlaza, 2015), the fresh fruit market is competitive, with extremely price sensitive retailers and consumers (ITA, 2018). Retailers often shop around to acquire cheaper fruit, which challenges wholesalers and distributors in supplying retailers.

3.4.4 Prices and comparative tariff advantages

Table 13 Singapore average CIF (cost, insurance and freight) prices (US$/kg, mostly Hass)

	2019	2020	2021
World	1.24	1.17	1.01
Thailand	1.20	1.05	0.78
Malaysia	0.59	0.58	0.63
Australia	2.68	3.12	3.42
India	1.75	2.13	2.36
China	1.75	1.51	1.59
Taiwan	1.89	2.02	2.73

Source: Trade Map

Price-wise, Thailand poses low-end price competition while Australia and Taiwan are positioned more in the premium range.

As Singapore has a very open market policy, no quotas or duties are applied to imports of mango from any country. There are, therefore, no advantages to Cambodia in comparison with suppliers from e.g., Mexico or the United States.

3.4.5 Trade fairs in Singapore and prospective importers

- World Food Fair
- Super Food Asia
- FHA Food & Beverage Asia
- Food & Beverage Trade Fair
- Asia Fruit Logistica (varied locations across Asia, incl. Singapore)

Table 17 Prospective importers

Prospective importer	Website
Khaishen	**http://www.khaishen.com/**
Fruitable	**http://www.fruitable.com.my/**
Chop Tong Guan (CTG)	**http://www.tongguan.com.my/**
Sheng Siong	**http://www.shengsiong.com.sg/**
Fresh Mart	**fmart.com.sg**
Fair Price Group	**https://www.fairpricegroup.com.sg/**
Singapore Fruits & Vegetables Importers & Exporters Association	**https://singapore-fruits-vegetables.org/members-listing/**

3.5 Mango – Japan

3.5.1 Japanese market opportunities and insights for fresh mango

The Japanese market for fresh fruit and vegetables has traditionally been dominated by domestic suppliers, with imports limited to a narrow range of products. However, Japan has steadily increased import volumes in response to decreasing competitiveness in the domestic farm sector, natural disasters and the opening up of imports. In 2021, total imports of fresh and dried fruit to Japan were valued at US$2.92 billion (calculation from COMTRADE data). Bananas, kiwis and avocados are among the most imported fruits. Mangoes rank 10th with imports worth US$38 million.

Table 18 Top 20 fresh and dried fruits imported by Japan (2021)

Fruit	USD million	CAGR 2017-21
Bananas, fresh	978.5	3.6%
Kiwi fruit, fresh	457.6	9.9%
Avocados, fresh	221.9	2.0%
Pineapples, fresh	151.2	4.8%
Oranges, fresh or dried	121.9	-0.3%
Grapes, fresh	115.7	6.6%
Grapes, dried	86.7	-1.2%
Fresh or dried lemons	77.4	-6.7%
Grapefruit, including pomelos, fresh or dried	58.8	-10.5%

Other, cherries, fresh	57.3	5.0%
Mangoes, fresh or dried	38.2	6.1%
Strawberries, fresh	38.2	5.8%
Prunes, dried	32.2	3.5%
Strawberries, containing added sugar	27.1	0.5%
Cranberries, bilberries, fresh	26.6	4.2%
Mandarins, fresh or dried	25.1	10.2%
Melons, fresh	22.8	-3.0%
Apples, fresh	19.4	19.5%
Wilkings, fresh or dried	15.2	4.1%
Raspberries, mulberries,etc	14.4	7.0%

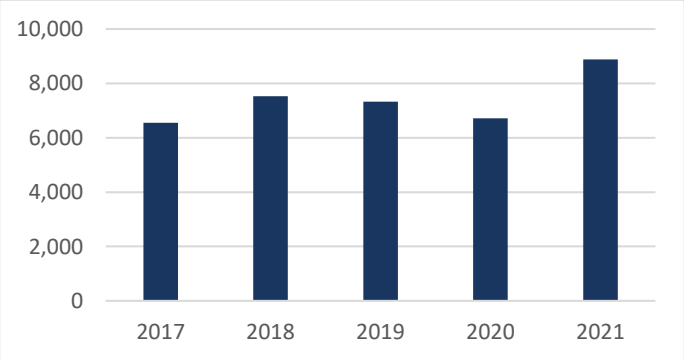
Source: Trade Map

Japan also grows its own mangoes - in 2020, this crop amounted to 3,462 tons (FAOSTAT). It should be noted that this figure is based on a broader category also including guava and mangosteen. These additional fruit categories are probably not produced in Japan but this cannot be confirmed. Mangoes are produced in Okinawa (close to Taiwan), Miyazaki and Kagoshima Prefectures. Irwin and Kent are the main varieties.

Prefecture	Variety	Season
Okinawa	Keitt, Irwin	May-Sept
Miyazaki	Irwin	Apr-Aug
Kagoshima	Irwin	Apr-Jul

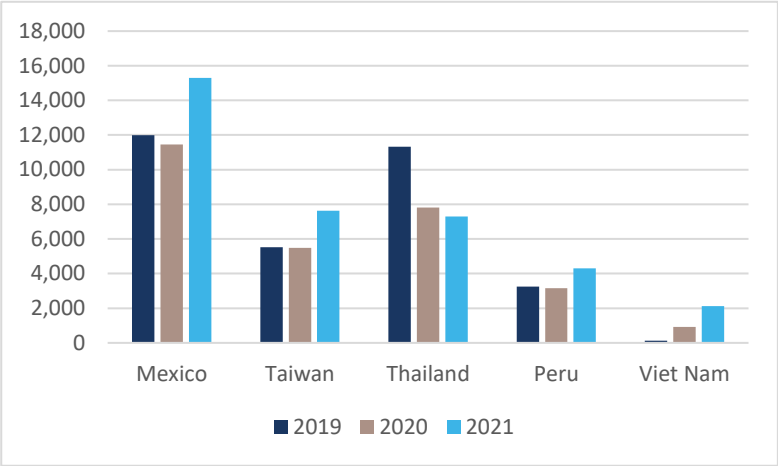
Source: Ministry of Agriculture, Forestry and Fisheries

Figure 5 Japanese imports of fresh mango (MT)



Source: Trade Map

Figure 6 Japanese imports of fresh mango – main supply sources (US$'000)



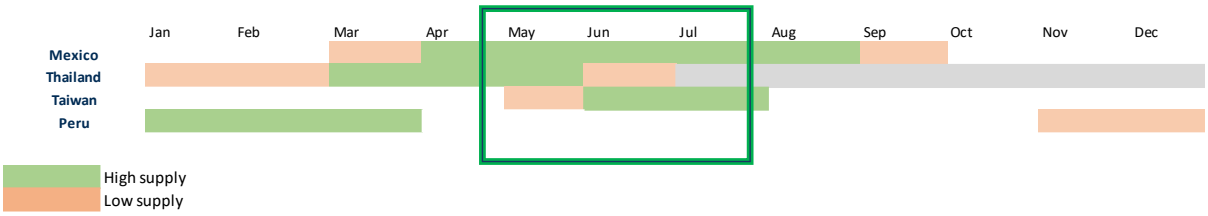
Source: Trade Map

Mexico, Taiwan and Thailand are leading mango suppliers to Japan. Taiwan and Mexico are key suppliers of Irwin, and Mexico and Peru of Kent. Irwin is the most popular variety, also supplied by the Philippines. Thailand's exports to Japan include other varieties, such as Nam Doc Mai and Maha Chanok. Japan's imports of 6-7,000 MT per year increased to well over 8,000MT over the period from 2017 to 2021, most likely in connection with the global pandemic which led to more home consumption.

The Philippines, India, Pakistan and Australia are the smaller suppliers on Japan's list of supply sources permitted to export fresh mango to Japan. The box below shows the countries that acquired permission to supply mangoes to Japan (and the year they acquired this permission).

Mexico, Thailand (1987), Peru (2010), Taiwan, Philippine, Brazil (2004), Pakistan, India (2006), Australia, USA, Vietnam (2015)

Figure 7 Mango seasonal windows chart – Japanese market



Source: Trade Map.

Again, Cambodia's supply window is indicated by the green box.

3.5.2 Market preference

Appearance is very important in Japan, where consumers prefer clean and safe products; prices drop significantly the moment the fruit shows any signs of blemishes or spots. Consumers appreciate sweeter fruits, and a higher Brix level is considered to represent higher quality. Size-wise, consistency is important, especially if the fruit is purchased as a gift.

The Japanese are very concerned about the nutritional content of fruit since they are very health-conscious. Information about the nutritional value of the fruit must be comprehensively reported on the label. The concern about the safety of imported products has been growing after a series of scandals about

Chinese food. In order to ensure the safety and reliability of agricultural products in Japan, the introduction of GAP (Good Agricultural Practice) is being widely applied.

INSIGHT ➔ Cambodia can respond to both: (1) the Japanese interest in the Irwin variety (Irwin is one of the varieties identified by MAFF as well-suited to grow in Cambodia); and (2) the high Brix level of Keo Romeath should be promoted (it has been identified through lab tests conducted by CAVAC).

(Irwin may, however, need to be grown off-season, as Cambodia's main season clashes with those of Mexico and Taiwan.)

3.5.3 Trends

Increase in frozen vs. fresh fruit consumption. Due to the increasing number of women entering the workforce and the rising number of single-person households, there is a desire to save time when cooking, leading to a shift from fresh fruits to frozen fruits, which are often pre-cut and require little preparation prior to consumption. At the same time, frozen products have a considerably longer shelf-life than fresh fruits, adding to their convenience as consumers do not need to make such frequent shopping trips. Furthermore, the stable price of frozen products will also support growth, as Japan has often experienced sudden price rises for fresh fruits in the last few years due to disasters and extreme weather events, which can also hinder retail sales of fresh fruits.

Premium fruits remain popular - One possible driver of growth for the category over the forecast period will be premium fruits, which have gained traction in Japan in recent years. Premium fruits are often served as a gift, which is an essential part of Japanese culture; different types of gifts are given on different occasions, such as Chugen in summer and Seibo in winter, when people give gifts to people, including family members and clients, in order to express their gratitude and to keep relationships smooth. Gifts are expected to continue to play a major role in the cultivation of relationships in Japan, which will support the demand for premium fruits

In recent years, Japan has experienced a **huge boom in fruit sandwiches**. These are made by putting fresh fruit and whipped cream in between two slices of bread. They have been around in Japan for decades, but they have gained renewed attention in recent years, as product varieties have increased, with specialty stores opening one after another. This has helped to retain consumers' interest in fresh fruits.

The biggest reason for the popularity of fruit sandwiches is the increasing prevalence of social media. With Instagram and Twitter enjoying increasing popularity in Japan, more and more people are looking for foods that look good on such platforms.

Although the **online retailing** of food and beverages is not yet a big segment in Japan, it is developing rapidly (IBER global, 2016). Many major supermarkets now offer online grocery services in most parts of Japan, including premium as well as discounted fruit in bigger boxes.

Table 19 Price and Tariff advantages (US$/kg)

	2019	2020	2021
World	4.58	4.37	4.30
Mexico	3.53	3.17	3.15
Taiwan	8.44	7.93	8.76
Thailand	5.07	5.38	5.73
Peru	4.21	4.23	4.16
Vietnam	5.81	5.09	3.62
Pakistan	4.25	4.45	4.96
Brazil	4.99	6.26	7.23
India	4.08	6.58	6.54
Philippines	5.28	6.68	4.88
Australia	9.79	11.00	12.00

Source: Trade Map

Taiwanese as well as Australian mangoes attract premium prices. Taiwan has unique premium varieties along with Irwin, which can be expected to raise the average price somewhat. Despite the long distance to market, Mexican mangoes collect lower prices in Japan. Given that Mexico is the largest supplier, this is probably connected to volume discounts.

In terms of tariff advantages, there is little to gain for Cambodia in respect of the Japanese mango market - a mere 3 per cent difference vs. Taiwan and Thailand, and 0 per cent difference vs. Mexico and Peru.

3.5.4 Trade fairs in Japan and prospective importers

- Foodex Japan
- SMTS Supermarket Trade Show
- IFIA – International Food Ingredients and Additives Exhibition

Prospective importer	Website
Funasho Shoji Co., Ltd	https://www.funasho-s.co.jp/eng/index.html
Nangoku Fruits	https://nangoku-f.shop
Royal	http://www.royal-jp.com/
Delta International	http://www.delta-i.co.jp
Marusei Trading Co., Ltd.	http://maruseishoji.com/
Robson Corporation	https://www.robson.co.jp/en/home

3.6 Mango – South Korea

3.6.1 Korean market opportunities and insights for mango

After signing several FTAs in 2003, South Korea opened the gates to its fruit market leading to a steady increase in fruit imports. South Korea's fresh and dried fruit imports expanded from 350,000 tons in 2002 to 730,000 tons today (Trade Map). Demand for dietary diversity continues to drive further growth in fruit imports, with several fruit categories – such as kiwifruit and durians - still showing very high average annual growth rates.

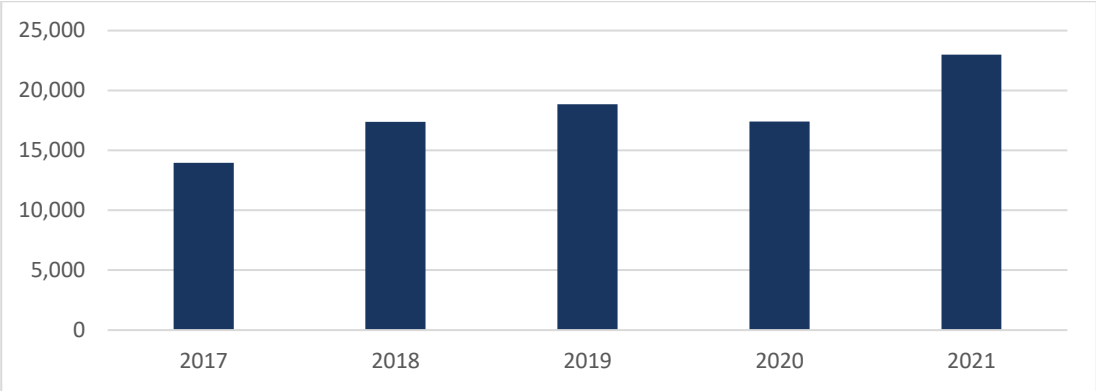
Mango, mangosteen and guava, as a group fruit category, are South Korea's 6th most imported types of fruit, also showing dramatic growth in imports over the last 10 years - up from 3,041 tons in 2012 to close to 22,982 tons in 2021. It is important to note that this fruit category consists almost entirely of mango (vs. mangosteen and guava). Thailand, Korea's largest supplier, has more detailed export statistics categories and specifies mangosteen and guava separately. Guava is a highly perishable product and is, therefore, rarely traded internationally and, unsurprisingly, Thailand does not export any guava to South Korea. Thailand's export of mangosteen to South Korea makes up about 10 per cent of Thai exports of mango-mangosteen-guava to South Korea. The Philippines' exports in this category are 100 per cent mango i.e., no mangosteen. Vietnam's exports are also likely to include some mangosteen, and the rest of the suppliers from South America do not grow or export this fruit. Hence, we can safely assume that more than 95 per cent of the South Korean import category of mango/mangosteen/guava relates to mango.

Table 20 Top 20 fresh and dried fruits imported by Korea (2021)

	USD million	CAGR %. 2017-21
Bananas, fresh or dried	290.2	-7
Oranges, fresh or dried	198.5	-5
Fresh grapes	172.3	3
Fresh cherries	168.0	-1
Fresh kiwifruit	145.5	20
Mangoes, guavas and mangosteens - fresh or dried	98.8	13
Pineapple, fresh or dried	52.6	-7
Avocados, fresh or dried	50.4	9
Lemons and limes, fresh or dried	42.2	-1
Fresh cranberries, bilberries	36.0	18
Fresh tamarinds, cashew apples, jackfruit, lychees, sapodillo plums, passion fruit, etc.	33.9	23
Grapefruit, fresh or dried	25.0	-6
Frozen strawberries	18.0	1
Dried grapes	10.3	-3
Dried peaches, pears, papayas, tamarinds	7.6	1
Dried prunes	6.6	14
Fresh durians	5.1	33
Fresh or dried figs	3.6	15
Fresh melons (excluding watermelons)	2.9	16
Frozen raspberries, blackberries, mulberries, etc.	2.6	12

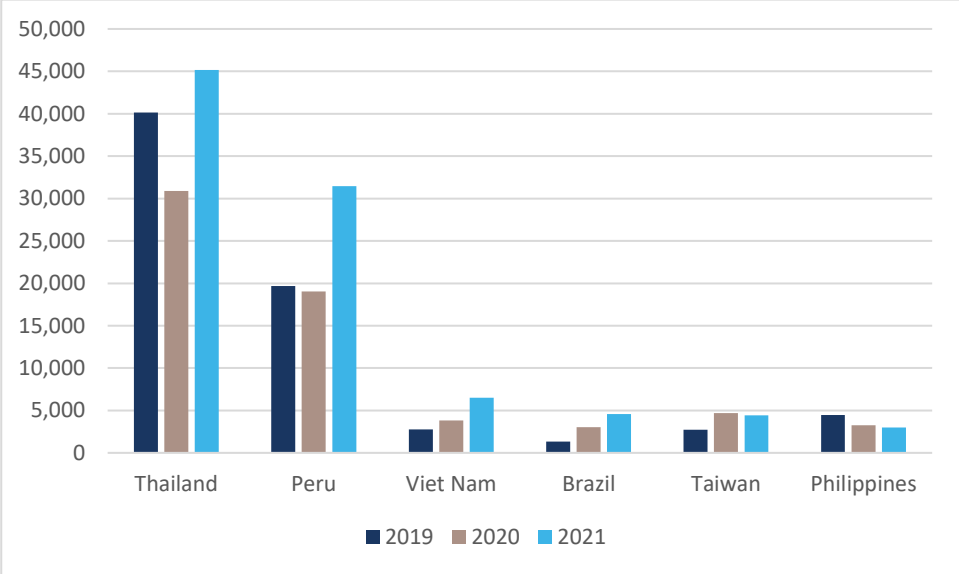
Source: Trade Map

Figure 8 Korean imports of mango, mangosteen and guava (MT) (95% mango)



Source: Trade Map

Figure 9 Korean imports of mango, mangosteen and guava – main supply sources (US$'000)



Source: Trade Map

Table 21 Approved supply countries and respective import conditions

	Main Import Conditions
Taiwan	Mango (Irwin, Haden) is produced in designated orchards, and vines in registered facilities, vapour heat treatment (VHT) (30 minutes at 46.5°C)
Philippines	VHT at the production site and registered facility (10-20 minutes at 46-47°C)
Thailand	VHT at the production site and registered facility (20 minutes at 47°C or higher)
Australia	Produced in registered orchards, steaming treatment for 15 mins at 47°C or higher
Pakistan	Produced in a registered orchard, hot water immersion treatment (more than 60 minutes at 48°C), the bakery at a registered facility
Vietnam (Mekong Delta)	Produced in the orchards registered for export to Korea, the bakery in a registered facility, heat treatment (more than 47°C for 20 minutes)
Peru	Produced in registered orchards, hot water treatment in registered facilities (at least 47 minutes at 47°C after fruit core temperature reaches 46°C)

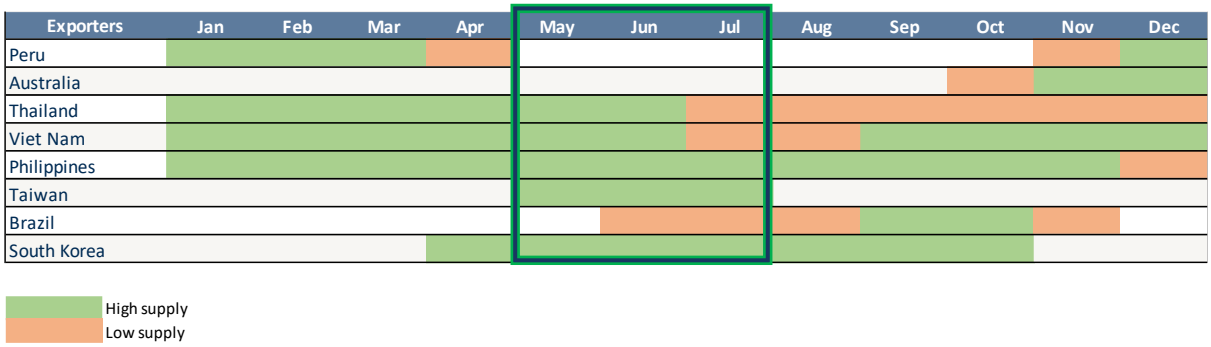
Brazil	Approved in 2017, VHT
India	Approved in 2017, VHT
Cambodia	Approved in 2019, VHT

Source: Queensland University Report, CRCNA, 2019)

Among the supplying countries that have gained approval to supply the South Korean market, Thailand and Peru lead with imports reaching US$45 million and US$31 million, respectively. Imports from both suppliers continue to climb along with the market after a dip in 2020 as a result of the COVID lockdown.

South Korea also produces some 400MT of mango in special greenhouse conditions, these are all Irwin variety, known in South Korea as 'apple mango'. The Korean grown version has a higher Brix (sugar) level and is retailed at premium prices, harvested and distributed during April to October. Thailand, Vietnam and the Philippines are able to supply year-round, though not in the same volume. Peru, South Korea and Australia have much shorter periods of supply. January through March is a period with a flood of mangoes from multiple leading suppliers. During Cambodia's peak season of April to June - equating to a May to July arrival in the market - there is also a Southeast Asian supply to contend with, but none from Peru or Australia.

Figure 10 Supplier seasonal windows – South Korean mango market



Source: Trade Map

3.6.2 Market Preference

Taste is the number one criterion for fruit selection, indicated by 48 per cent of South Korean consumers. Most prefer sweet (36 per cent), followed by a sweet and sour flavour (23 per cent) as well as mangoes that are juicy and fresh (19 per cent). Mangoes, therefore, should be sweet, juicy, have a yellow-orange colour and a smooth texture (FreshPlaza, 2019). Cambodia's Keo Romeath fits these broader parameters well, along with Irwin and R2E2, which can also be found on the South Korean market.

Besides taste, South Korean consumers' assessment of fruit quality is also much based on appearance. Mangoes are often seen as a premium quality fruit. Typically, the higher blush ratios, and more redness in the fruit, are appealing to consumers – qualities that favour the R2E2 variety.

3.6.3 Trends

Online retailing of fresh produce is taking off in South Korea in response to growing demand from consumers. The online grocery market is expanding in South Korea, with demand for delivery services rising among young people living alone, and childless couples. Both demographic groups are growing in Korea (Fruitnet.com). According to the Korea Statistics Office, online food and

agricultural sales in Korea increased by 61 per cent in 2020, compared with 17 per cent growth in overall online retail sales.

Sensitivity to safe and healthy food products – South Korean consumers' ever strengthening interest in, and sensitivity about, food products that are safe and healthy is a well-established trend. Used in their everyday language, the term 'well-being food' refers to food products or ingredients that are advertised as having functional health benefits. The trend is a strong driver for the continuing heavy demand for avocado with its great health benefits.

3.6.4 Price and Tariff advantages

Table 22 Average South Korean CIF import prices, US$/kg

	2019 CIF, US$/Kg	2020 CIF, US$/Kg	2021 CIF, US$/Kg
Thailand	3.63	3.52	3.78
Peru	3.63	3.52	3.78
Vietnam	4.65	4.20	4.84
Brazil	3.45	3.44	4.07
Taiwan	5.42	6.71	6.85
Philippines	5.89	5.77	5.80

Source: Trade Map

In terms of price, Thailand and Peru compete (for part of the year) at the lower end of the market while the Philippines and Taiwan operate at the higher end.

Table 23 Comparison of tariffs applied by South Korea on fresh mango imports

Regime	Tariff	Competing suppliers
MFN	30%	Brazil, Taiwan
ASEAN	24%	Cambodia, Philippines, Thailand
Korea-Vietnam FTA	9%	Vietnam
Korea-Peru FTA	9.3%	Peru
Australia-Korea FTA	6%	Australia

Source: Market Access Map

In terms of price, Peru competes with lower-end prices with large volumes over a short season. Supply from Taiwan and the Philippines achieves more premium prices.

From the perspective of tariff advantages, South Korea is less attractive for Cambodia, losing out significantly to Vietnam, Peru and Australia, but on a par with Thailand.

3.6.5 Trade fairs in Korea and prospective importers

- Seoul Food and Hotel
- Bofood (Busan International Food Expo)
- Food Week Korea
- FI Korea

Prospective importer	Website
Aser / Heimfood	**http://aser.co.kr/about.html**
CJ Freshway Corporation	**http://www.cjfreshway.com/**
Green Sharp Trading Co.	**https://www.southkoreayp.com/company/78951/GREEN_SHARP_TRADING_CO**
Hyundai Green Food	**http://www.hyundaigreenfood.com/**

4 Processed fruit

4.1 Processed fruit – EU (dried mango, mango purée, frozen mango, dried banana)

4.1.1 European market opportunities and insights for dried mangoes

European imports of dried mango are estimated at between 1,600 and 3,400 tons, annually, depending on the year. In contrast to attitudes towards fresh mango, the European consumer still has very little awareness of the product, and, as a consequence, the size of the market is still small. Dried mango represents a mere 1 per cent of European dried fruit imports. To put things into perspective, 3400 tons is the equivalent of x 13.5 (12–15 tons of fresh fruit to make 1 ton of dried). That is 45,900 MT against 666,000 MT of fresh mango imported by EU countries – a difference of enormous proportions.

About 35 per cent of European imports are sugar infused, for which the main producer and exporter countries are Thailand and the Philippines. This is an intermediate industrial product, since it is mainly earmarked for dried fruit mixes and muesli. It is imported in high-volume containers. About 50 per cent of European imports are conventional tray-dried with added preservative, mainly supplied by South Africa, and mostly Kent and Keitt varieties (Pierre Gerbaud, FruiTrop Online, 2016). As South African companies like Westfalia collaborate with West African country producers like Mali, Ghana and Burkina Faso to capture more seasons, these countries are also becoming suppliers of Kent and Keitt conventional non-sweetened fruit. Thai and Cambodian producers are also starting to include non-sweetened conventional fruit in their offering.

The remaining 15 per cent of supply to the European market falls into the organic category, mainly supplied from West Africa.

The largest markets in volume terms are the UK, Germany and Switzerland. UK imports are estimated at between 1,200 MT and 2,000 MT of which approximately 10-20 per cent is in the organic and ‘fair trade’ sector. Germany’s imports are estimated at around 500 MT and Switzerland’s at about 200–350 MT. Organic / Fair Trade, particularly from Burkina Faso, is important in Switzerland, making up about 20–30 per cent of Swiss imports. According to Gerbaud, FruiTrop and CBI, France, Italy and Spain are smaller markets in the range of 100-200 MT.

Some more noteworthy characteristics and trends relating to the European dried mango market include:

- The most desired attributes of dried mango for the European markets are a sweet taste, a strong flavour similar to fresh mangoes, and a pale orange colour.
- Demand for (mixed) dried tropical fruits and exotic fruits is expanding, which includes dried mango.
- Demand for processed dried fruit snacks as an alternative to sugared snacks is expanding. There is, at the same time, however, increasing awareness of the high sugar content of dried fruit compared with nuts. So, for some consumers, dried fruits are considered too sugared.

- There has been a shift away from the use of added sugar, hydrogenated fats, artificial colours and preservatives to natural or artisanal dried fruit. This implies a good opportunity for natural dried mangoes.
- There has been more use of dried fruit in home cooking (e.g., exotic cuisine) and more use of dried fruit in cereals as a healthy ingredient.
- There has been increasing segmentation in the market with the creation of health-conscious consumers, busy, on-the-go consumers, obese consumers on a diet, sports enthusiasts, schoolchildren or vegetarians.
- In Italy, innovative ideas and new recipes using dried fruit – including dried mangoes – have emerged in Italian cuisine. Nevertheless, the existence of dried mangoes is still relatively unknown.
- Germany is the largest market in Europe for dried fruit. However, dried mango has not taken off.
- In addition to the organic/health food corners of major supermarkets like Tesco, Sainsbury's, Carrefour and Conad, dried mangoes are also often found in 'fair trade' or organic shops like Artisans du Monde or Biocoop.
- Dried mangoes are increasingly available from online sellers like www.healthsupplies.co.uk and www.buywholsefoodsonline.co.uk.

The growth of dried mango in European markets is still constrained, unable to achieve its true potential, as, currently, awareness is limited. Big campaigns are required, but the market is too small to justify the investment required for such activity. So, progression is currently limited to smaller efforts from producers. There is **more scope for growth in the industrial food ingredient segment such as for breakfast cereals and energy bars**. However, this will remain constrained by the lack of consistency of supply throughout the year. This will continue to change as freeze-dried continues to enter the market. **Dried mango has a shelf-life of six months, while freeze-dried mango has a much longer one – 25-30 years** - with a very low percentage of moisture at 1-2 per cent, compared with 10–15 per cent. The challenge is, however, the cost of freeze-drying, as it is significantly higher than that of conventional drying. Scientific testing has also proved that freeze-dried maintains phenol content more efficiently, which is known to help in protection against breast and colon cancers. Some brands in Thailand have pioneered this method and have already been on the market for several years.

4.1.2 European market opportunities and insights for mango purée

Second to the Middle East (where juice consumption is high, and mango and guava are strong favourites) Europe offers a sizeable market. CBI, the Netherlands, estimates the EU market for single strength mango purée to be around 42,000 tons, but this includes intra-EU shipments. AIJN, the European Fruit Juice Association, states that the level of imports into Europe of mango juice stands at 20,000 tons.

Recommendation: Fruit purée is, therefore, a much bigger market outlet for Cambodia than dried mango. In the equation, one should also consider the weight loss from fresh-to-dried compared with fresh-to-purée or concentrate.

Recommendation: Thai mango purée production and export are also very significant – US$39m. Thailand's mango purée capacity is important for Cambodia's institutions to take good note of with a view to attracting investment in this form of processing in the country – to capture the flood of mangoes in the main in-season period.

- A large share of internal EU imports of mango purée is held by the Netherlands, which further redistributes imported mango purée to other European countries. EU imports of mango purée are highly concentrated, and three top importers (the Netherlands, the United Kingdom and France) account for almost 80 per cent of total European imports.
- India, the leading supplier of mango purée to Europe, accounts for almost 60 per cent of all supply to that continent. The main mango varieties used for purée production are Alphonso, which is the most sought-after owing to its intense flavour and attracts an entirely different price category, and Totapuri, which is the large volume-filler collecting the base price. Considering the size of India's market share, it is important to carefully monitor mango crops in India, as years with a lower harvest will mean higher demand for mango purée from other developing countries, and a chance to open the market and establish a future position in the EU market. In the long run, India is expected to struggle to meet

demand in its domestic market where growth, particularly of mango juice, is now reaching remote corners of the country where hundreds of millions of consumers are able to spend more. Therefore, Indian dominance in the European market may start to wane in the future.

- South and Central American countries are gaining market share in Europe, particularly Mexico, Brazil, Ecuador, Guatemala, Cuba, Peru and Costa Rica.
- At the same time fruit juices are facing a crisis. According to the FoodNews' interpretation of a Euromonitor report, the outlook for the consumption of fruit juices in western European countries is negative, as fruit juices have an 'identity crisis'. Volumes are down for a variety of reasons and value growth is minimal. Health trends as well as perceptions of what is fresh and natural are changing, while iced teas, energy drinks and sport drinks have outperformed. However, not-from-concentrate (NFC)[14] juices have experienced a positive growth in consumption. Mango juice is more frequently marketed as the product of a 'superfruit' which is rich in vitamins, minerals and antioxidants, while it also contains an enzyme with stomach-soothing properties similar to papain found in papayas.
- Initiatives in corporate and environmental responsibility are increasing in impact on EU markets. In particular, the Fairtrade, organic and functional foods market are growing. European buyers indicate great readiness to purchase any Fairtrade mango purée.
- The demand for organic mango purée is continuing to increase. European buyers are constantly searching for new suppliers, especially in Asian countries other than India, to reduce their dependence on Indian suppliers. However, new suppliers are taken into consideration only if they can supply mango purée with a high Brix level, and intense colour and flavour.

4.1.3 European market opportunities and insights for frozen mango

Table 24 Leading importers of frozen mango in Europe (EU+UK)

	2018	2019	2020
Germany			
US$ million	24.3	21.1	24.2
Tons	13,884	12,310	13,716
France			
US$ million	18.8	19.4	18.6
Tons	8,827	8,895	8,139
Netherlands			
US$ million	19.3	28	30.5
Tons	12,412	18,102	19,611

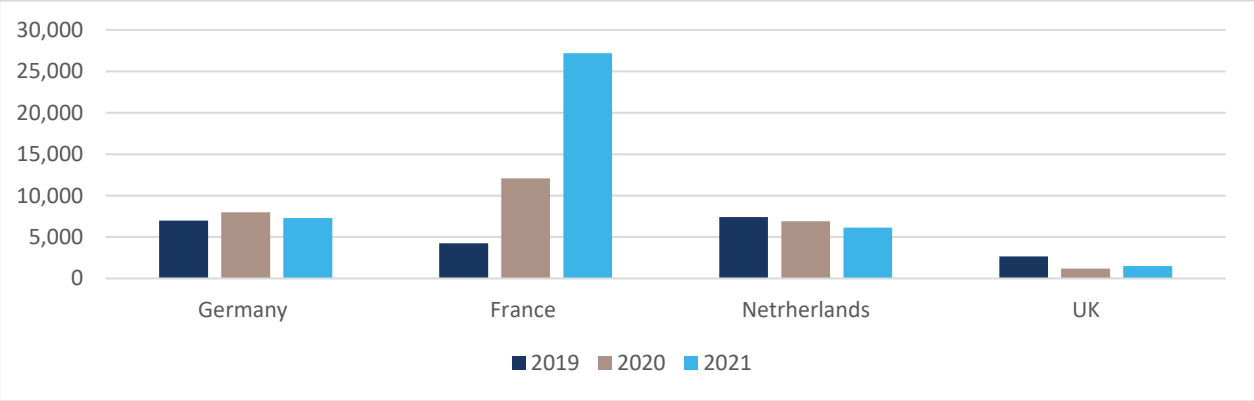
[14] **For ease in respect of international shipping, juices are concentrated, i.e., the water content is highly reduced to make it much lighter, and then it is rehydrated in market. This process does result in the loss of some flavour and freshness. NFC has, therefore, been gaining in popularity in recent years**

UK			
US$ million	15.1	13.5	19.2

Driven mostly by the popularity of smoothies - consisting of blended fruit with yoghurt and nuts etc. - demand for frozen mango chunks is expanding strongly. This goes hand-in-hand with demand for frozen purées, used in many ice-creams, yoghurts and bakery products that are increasingly seeking tropical fruit flavours. The technology and logistics required for frozen chunks and frozen purée is very similar.

4.1.4 European market opportunities and insights for dried banana

Figure 11 Leading European (EU+UK) markets for dried banana (US$'000)



Source: Trade Map

Dried banana (chips) are a relatively small market in Europe, now surpassed by dried mango. Total imports in Europe reached US$26m at around 3,500 MT. Germany is a key market and showing rapid expansion as the market for dried fruit snacks has spread from sales in German nature and organic shops to mainstream supermarkets. Breakfast cereals and snack/energy bars are important outlets for dried banana – freeze-dried is increasingly recognised as well suited for this channel. Ecuador and China are important suppliers.

4.2 Processed fruit – China (dried mango, dried banana, dried longan)

4.2.1 Opportunities for dried fruit (incl. mango, banana chips and durian) in China

China is no stranger to dried fruits, nuts and seeds, being a world-leading producer of walnuts (1mln. MT), almonds (45,000 MT), hazel nuts (45,000 MT), raisins (190,000 MT) and melon seeds (30,000 MT) (USDA; FAOSTAT; Statista).

- According to an article on ProduceReport.com more than 60 per cent of Chinese consumers are aware of the health benefits of tree nuts, and, consequently, consumption is gradually increasing. However, China's per capita consumption is still low compared with other countries, creating tremendous potential for market growth.[15]
- The article also states that China's tree nut sector is further evaluating additional strategies for increasing consumption, such as reducing the use of additives, packaging innovations like the introduction of small packets containing a recommended daily quantity, and developing new combinations of nuts and dried fruits.
- Rising consumer disposable income, with improved living standards in the country, is also resulting in increased spending on processed foods, including dried fruits and nuts, and a willingness to buy these

[15] **https://www.producereport.com/article/analysis-forecast-chinas-tree-nut-sector-201920**

products as snacks. Especially among young urban dwellers, consumption patterns are rapidly changing, as they seek convenience and are eager to taste new products. They have less time to eat because of their work commitments and spend a vast amount of time commuting. Snacks are, therefore, a convenient alternative to sit-down meals.

- Increased health awareness has also been an important driver as nuts and fruits fall into the category of 'healthy snacks'.
- The popularity of dried fruits is also simply connected to availability. Their proximity to Southeast Asian countries means that the Chinese have access to a wide range of tropical dried fruits.
- Success of online promotions and sales has also been a key driver of consumption especially of dried fruits and nuts.

In terms of dried fruit preference, a study conducted by the EU SME Centre, suggests that Chinese dates and Chinese plums are the most sought after, followed by dried mango, dried banana (chips) and durian. The study also highlights the major brands in retail stores: Vinamit (Vietnamese); Sabava (Chinese, but sourced mostly from Southeast Asia); Fresh Gravitational (Chinese); Be&Cheery, Lyfen, and Three Squirrels are also big brands that are available online. It should be added here that a brief search online reveals, (a) the popularity of dried mango but also, (b) that it is already quite a crowded market.

A detailed study, conducted by Wageningen University in the Netherlands, looked into Chinese taste preferences towards dried mango. These can be identified as follows:

- A strong preference for the natural product without any additives such as spices.
- Non-sweetened with fewer calories (though candied mangoes are common online).
- Chewy/soft preferred over hard and crispy.
- Natural colour. To Chinese consumers it is very obvious that the dried mango colour should be similar to the fresh mango.
- Sweet taste preferred over sour.
- Closest to the natural fruit flavour preferred.

Organic certified dried mango is, therefore, difficult to sell as it tends to be harder to chew and a darker colour.

Yuan 195 – 250g box, www.toaboa.com

Nutstop.com

Since online retail is so big in the dried fruit sector, web usage data is a good indicator of consumption patterns. The frequency of web searching related to dried fruits reaches its peak during the Spring Festival. According to Chinese tradition, during the Spring Festival, dried fruits and nuts should be offered to guests and it is common to have several dishes that contain dried fruits at a banquet. Dried fruit is also a typical gift to offer during the holiday. Therefore, it is just as critical to have your dried fruits on the market during Spring Festival as it is your roses on Valentine's Day.

It is unfortunately not possible to decipher dried mango/fresh mango Chinese import statistics, but there is ample evidence that the market is swallowing up Cambodian, Thai (exports to China have expanded 10-fold in five years, Trade Map) and especially Philippine dried mango supplies. Chinese traders are also trading dried mango around the world from other origins such as Vietnam and the Philippines – hence, not all Chinese dried mango demand is destined for the Chinese market. Details about this are, however, murky.

Data about banana chips is also lacking. They are definitely also on offer as a snack food, and almost as popular as dried mangoes. There is competition, though, from the local supply of dried Chinese-produced bananas – there are particularly many players in freeze-dried. Although China is a mega importer of bananas (US$943 m of banana imports in 2021), as Cambodia knows full well (as an upcoming supplier, supplying 348,000 tons of bananas to China in 2021), China is itself a significant producer of bananas. Dependence on foreign supply has much to do with reliability of supply, as Chinese bananas grow in a typhoon-prone region. The Chinese banana industry is not great at post-harvest handling, so, as a result, there is a good market for dried produce.

The European and US food industries are an important outlet for dried mango and dried banana chips, beyond their consumption as a snack, for use in breakfast cereals, especially the wide range of mueslis. Dried banana is especially used for cereals, and the Philippines is a leading supplier. A recent article on Philippine banana chippings counts 41 processor–exporters with individual capacities of 20–60 tons a day (potato-chips-machine.com). In China, breakfast cereals are not common, dried/vacuum fried bananas are consumed more as snacks.

Pointer: In recent years the Philippines has had boom and bust years with banana harvests. During bust years the dried chips business has been heavily affected since raw material prices rise too high to compete.

Recommendation: In the same way as this has driven a Filipino mango-dryer to invest in setting up facilities for production and export from Cambodia, the banana chipping industry can be encouraged to do the same with the right investor incentives.

In the Philippines, banana chips are typically made from the cardava banana variant, and some luxury lines include Cavendish. In Cambodia, besides the newly established Cavendish production for export to China as fresh, there is still a large output of other traditional varieties which are not preferred by fresh-export markets. In Thailand the Golden Banana (*Musa* sp., AAA group, Gros Michel subgroup, cultivar 'Hom Thong') is the preferred variety for processing. Cambodia is likely to have an equivalent.

Also, more and more cereal, energy and protein snack bars are on the market, some of which are starting to incorporate dried mango. This, unlike breakfast cereals, is starting to pick up in China. For the Chinese snack bar market, Mordor Intelligence forecasts a 9.7 per cent CAGR between 2019 and 2025 to reach US$96.33m. Mordor Intelligence attributes this growth particularly to the considerable presence of the ageing population in the nation seeking natural and nutritious convenience foods. But, according to Mintel Food and Drink, also among younger people, protein or energy bars targeted at sports or exercise lovers have strong growth potential. And this segment of the population is growing – they are consumers aspiring to live a healthy life-style with an increasing passion for working out or enjoying sports activities.

4.2.2 Opportunities for longan in China

Unlike dried mango and banana, longan has its own trade classification. As the table below shows, imports are increasing beyond US$200m and Thailand (with the lion's share) and Myanmar are key suppliers. Although Thailand exports fresh longan to markets other than China – namely Indonesia and Hong Kong – its dried exports go almost exclusively to China. Thailand's longan sub-sector strategy document also explains that the nature of Thailand's longan markets reflects the world situation: China – fresh and dried; Hong Kong and Indonesia – fresh; Malaysia – canned. One can, therefore, conclude that China is 'the market' for dried longan.

Pointer: Until China approves the import of fresh longan from Cambodia (and in the meantime grey channels will continue to get tougher as the Chinese government clamps down on them) Cambodia should focus on developing drying capacity and exporting dried fruit, for which the Chinese government's approval conditions are less stringent.

Recommendation: Cambodia dried mango processors can investigate the feasibility of expanding their drying capacity to longan growing areas.

Table 25 China's imports of dried longan 2019-21 (US$'000)

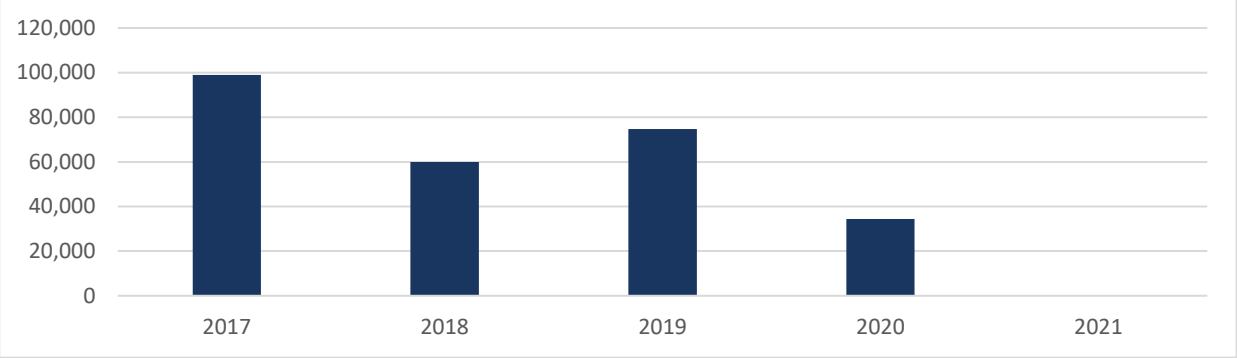
	2017	2018	2019	2020	2021
Total	**91,345**	**125,342**	**144,817**	**179,335**	**203,721**
Thailand	**84,702**	**120,000**	**144,323**	**178,847**	**203,649**
Myanmar	**6,612**	**4,983**			

Table 26 China's import of fresh longan (US$'000)

Exporters	2017	2018	2019	2020	2021
World	437,722	365,577	424,675	491,372	705,464
Thailand	248,588	177,650	353,690	488,321	704,961
Vietnam	188,987	187,927	70,985	3,051	503

Source: Trade Map

Figure 1 Indonesian imports of fresh longan, U$$ m – >99% from Thailand, MT



Source: Trade Map

Longan fruit is well-known in the Chinese market. Traditionally, it is widely consumed in the Guangdong province, so imports in Guangzhou are significantly higher than those in other Chinese cities (Fresh laza).

Chinese consumers believe that a fresh, peeled longan has the appearance of a dragon's eye, and eating the fruit is a pathway to prosperity. Longan is also cited in traditional Chinese medicine books as a source of nourishment for the body, the brain and the eyes.

In addition, longan is an important ingredient during the Spring Festival. On the 8th day of the 12th lunar month, many families make laba porridge, a delicious dish made with glutinous rice, millet, seeds of job's tears, jujube berries, lotus seeds, beans, longan and gingko.

As mentioned earlier, besides being a porridge ingredient, dried fruits are important snacks in general during the Spring Festival, for which longan has a special meaning symbolizing 'reunion'. Usually dried longans are served unshelled. You can eat the flesh directly or make tea with it. Thai exporters of dried

longan maintain that colour is of critical importance to Chinese importers – especially of the shell – and that this is always checked.[16]

Table 27 Top 7 Chinese snacks consumed during the Spring Festival that have a special meaning

Snack	Meaning
Red Dates	Wealth and prosperity
Peanuts	Vitality and longevity
Dried Longans	Reunion
Sunflower Seeds	Having many sons and grandsons
Sweets	A sweet life
Steamed New Year Cake	Prosperity and promotions
Glutinous Rice Dumplings	A bumper grain harvest

Source: Chinahighlights.com

Tariffs and prices

Table 28 Average CIF Chinese import prices – longan, fresh and dried

	2019	2020	2021
China – Average Fresh Longan CIF prices US$/kg			
Thailand	**1.27**	**1.43**	**1.50**
Vietnam	**0.56**	**0.66**	**0.51**
China – Average Dried Longan CIF prices US$/kg			
Thailand	**1.26**	**1.34**	**1.55**
Indonesia – Average Fresh Longan CIF prices US$/kg			
Thailand	**1.86**	**1.78**	

Table 29 Comparative Tariff Advantages

Code	Tariff	Regime	Exporting Country
China - country approvals / no quota			
0810903000 - fresh	12.0%	MFN	
	0.0%	ASEAN-China FTA	Thailand, Vietnam, Laos, Cambodia
	0.0%	China: Asian LDCs	Cambodia, Laos
0813401000 - dried	20.0%	MFN	
	0.0%	ASEAN-China FTA	Thailand, Vietnam, Laos, Cambodia
	0.0%	China: Asian LDCs	Cambodia, Laos, Myanmar

Although China's MFN (most favoured nation) rates are quite a bit higher than the 0 per cent rate it applies to ASEAN and Asian LDC supplying countries, ASEAN countries are the key supply sources, so there is basically no tariff advantage to be found for Cambodia.

[16] **The Thai standards for whole dried longan can be found at** https://www.acfs.go.th/standard/download/eng/Dried_whole_longan.pdf

4.3 Processed fruit – Japan (dried banana, dried mango, frozen mango)

4.3.1 Opportunities for dried and frozen fruit in Japan

Japan's fruit market has traditionally focused on production and consumption of fresh fruits. Until recently, very little fresh fruit has been produced specifically for processing purposes, except for juice. This is largely because fresh fruit tends to be treated as a premium product, attracting relatively high prices, so there has been little incentive for farmers to focus on producing lower-grade cheaper fruit just for processing purposes.

The recent increase in Japan's import of various forms of processed fruit reflects an ongoing change in the way Japanese people consume fruits. Growing health-consciousness is boosting potential demand for good-for-you foods including fruits. Changing lifestyles and demographics, such as the growing number of women in the workforce and single or elderly households, have led to increasing demand for fruit that is easy-to-eat and easy-to-consume, easy-to-peel, and fresh-cut fruits. Convenience is going further to also include convenience in the form of 'not perishable' with a growing interest in dried and frozen fruits as well as fresh. This also coincides with increasing health awareness opting for dried fruits and nuts as well as healthier drinks such as fruit smoothies.

In addition, the food industry is seeking to offer food and beverages that contain 'real fruit' and to promote fruit textures or pulps. This is also enhancing demand.

Table 30 Japanese imports of processed fruits, MT

	2017	2018	2019	2020	2021
Dried banana (whole and chips)					
World	437.8	520.6	441.7	321.7	234.4
Philippines	332.8	384.0	332.8	179.7	153.6
Vietnam	71.4	52.4	63.6	91.8	50.1
Thailand	29.6	80.1	38.0	46.2	27.2
Sri Lanka	2.6	2.0	3.2	1.1	2.5
Dried mango, mangosteen and guava (mainly mango)					
World	66.0	101.0	102.1	106.3	93.9
China	20.6	33.3	19.6	4.8	22.9
Cambodia	0.0	1.0	1.6	19.0	16.7
Mexico	4.6	17.5	15.4	22.4	12.9
Thailand	4.1	8.0	14.7	12.8	10.0
Burkina Faso	3.2	4.7	4.0	8.0	8.5
Philippines	11.5	7.3	6.8	6.2	6.1
Frozen exotic fruits (incl. mango, papaya and avocado)					
World	9,607.4	9,593.6	10,494.9	9,358.0	10,206.5
Peru	4,340.3	3,803.3	4,663.3	3,799.7	3,725.0
Vietnam	1,688.6	1,540.5	2,076.8	2,026.1	2,294.6
Thailand	1,876.8	2,172.6	1,617.8	1,867.0	1,760.3
Philippines	300.7	422.6	378.7	331.1	648.6
Colombia	0.0	0.0	240.0	527.6	626.5
China	637.7	866.7	853.7	343.3	557.0
Mexico	463.1	600.1	508.0	323.4	360.2

Source: Trade Map

An upward trend can be witnessed in imports of dried mango and frozen mango/avocado. Frozen is a significantly larger market. South American suppliers are supplying the bulk of frozen avocado while Vietnam, Thailand and the Philippines supply more frozen mango and papaya. Since 2020, Cambodia has become an important supplier of dried mango.

4.3.2 Standards

Japan's food safety standards are very stringent, and this especially applies to frozen fruit. (For legal requirements see the Japanese market requirement guide in Annex 1.) The Japanese industry is familiar with, and will expect standards comparable with, JFS-C (Japanese Food Safety Certification) which is comparable to BRC or ISO 22,000 that have been adopted by several of Cambodia's dried mango companies.

4.3.3 Prospective buyers

Dah Chong Hong (Japan) Ltd	https://www.dch-japan.com/en/business/
Royal Co., Ltd.	http://www.royal-jp.com/english/
Kyoka Shokuhin Co., Ltd.	http://www.kyoka-sk.co.jp/
DELTA International Co., Ltd.	http://www.delta-i.co.jp
Eiko Boeki Kaisha, LTD	https://www.eikoboeki.co.jp/en/
Life Foods Co. Ltd.	https://www.lifefoods-tokyo.co.jp/en/

5 Cashew

5.1 Product definition

Cashew, known as *Anacardium occidentale*, is native to Brazil and was introduced to Mozambique and then to India in the 16th century by the Portuguese as a means of controlling coastal erosion. It was spread within these countries with the aid of elephants that ate the bright cashew fruits along with the attached nut. It was not until the 19th century that plantations were developed, and the tree then spread to a number of other countries in Africa, Asia and Latin America. It was exported from there to the wealthy western markets and has since become a multi-billion-dollar global crop.

In terms of definition, nuts are mainly categorised according to whether they are shelled or unshelled and by size grades and whether they are whole, split or in bits.

Table 31 Trade Data Classification

Code	Label
080131	**Fresh or dried cashew nuts, in shell**
080132	**Fresh or dried cashew nuts, shelled**

5.2 World status

The world produced a colossal 4,180,990 MT of raw cashew nut in 2020, up from 3,686,921 MT in 2014. Mega producers include Cote d'Ivoire, India, Vietnam and Indonesia. There are, however, about 40 significant producing countries. Region-wise, West Africa produces the most - close to half. Over the years, Vietnam and India have become specialised hubs in shelling – not an easy process, especially in avoiding

breakage losses. The only other country where shelling takes place in significant volumes is Brazil. This, however, is only for Brazilian cashews because the Brazilian government prohibits imports of RCN. For a long time, these three countries have been the leading suppliers of value-added shelled cashew nuts (CN). Due to reductions in the cost of technology, along with labour supply issues, Vietnamese and Indian export activities are starting to wane and other countries are initiating their own shelling of RCN. These include Cambodia where three or four processing plants have started operations.

5.3 Cambodian status

FoodNews, a reputable agro-food journal, gathered information from the Royal Government of Cambodia (RGC) stating that Cambodia exported 202,318 tons of RCN in 2019, doubling the exported volume of 2018. In the same article, FoodNews also stated that Cambodia's cashew planted area totalled around 160,000 hectares and that the country's government is receiving funds from Vietnam and Switzerland to reach 1,000,000 tons of RCN in the long-term through increased yield. Currently, Cambodia's yield is half that of its neighbour, Vietnam, where yield exceeds 2 tons/ha. Cambodian cashew is recognised for its good kernel size, taste and low level of chemicals – 'organic by default'.

For the foreseeable future, Vietnamese processors are and will remain main importers of Cambodian RCN, but, gradually, Cambodia can start to seek its own markets for CN directly. Besides value addition (when costs are adequately managed), own-processing gives Cambodia a key competitive advantage in:

- Much reduced carbon footprint as the RCN are not sourced from the other side of the globe.
- Increasingly sought traceability – as the single source makes this much more manageable than when RCN from many places is mixed up, which is the case in Vietnam.

Through close collaboration with MAFF, organic certified cashew is starting to slowly emerge. Fair Trade Labelled cashew, is an alternative option, but has not really taken off because there are challenges with the Fair Trade system that: (a) does not cater to sizes other than W320, which is smaller than the Cambodian average nut size (see section 5.4.2 below), and; (b) assumes no processing losses, which is not a practical or viable solution for processors.

It will be tough for Cambodian processors to become competitive in the face of Vietnamese competition, which is highly efficient owing to the scale at which it operates. A real challenge will be to secure a robust supply chain for RCN, starting with convincing Cambodian farmers not to sell to Vietnam. This has much to do with the cost of large amounts of finance required by processors for buying up raw material during the single short harvest period for processing over the remaining 10 months of the year. This will be a further challenge if and when Vietnamese processors start to offer higher prices to avoid loss of supply against competing Cambodian processors. The issue for Vietnam will not only relate to a general loss of supply, but also to the loss of an important early season supply, given that Cambodian harvests are ahead of the African supply.

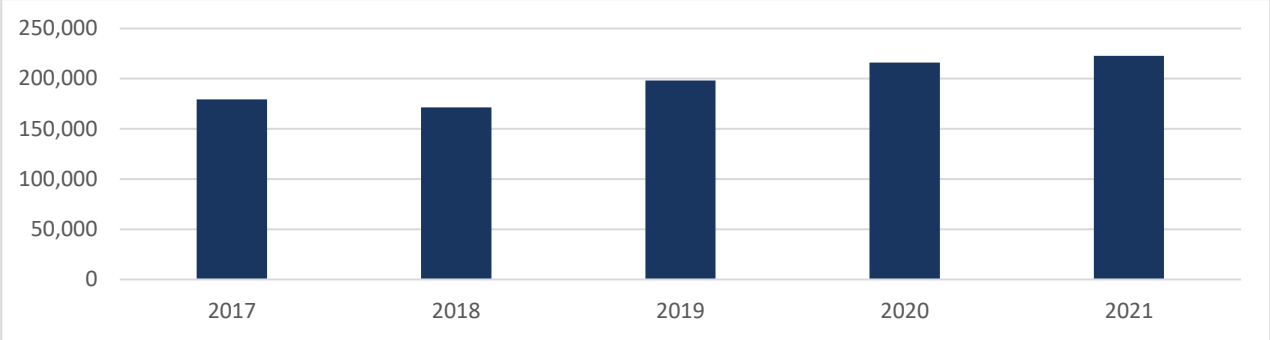
International buyers are starting to see an increasingly urgent need to diversify their sourcing away from over-dependence on Vietnam. In this spirit they are likely to be inclined to show some leniency to Cambodian processors by paying slightly higher prices to compensate for initial challenges. This can, however, be expected to be only a small increase. Therefore, the processors will still be required to operate efficiently and to run effective businesses. The opportune moment for buyer openness could allow Cambodia to make an important leap to participation in the market domain of value-added CN.

The RGC is working on a new cashew policy which will focus on ways to make the sector more competitive in the context described above. All being well, processors and/or growers will be bolstered by some effective incentives.

5.4 Cashew nuts – Europe

5.4.1 European market opportunities and insights for cashew nuts

Figure 13 European (EU + UK) imports of shelled cashew nut, 2017-21 (tons)



Source: Trade Map

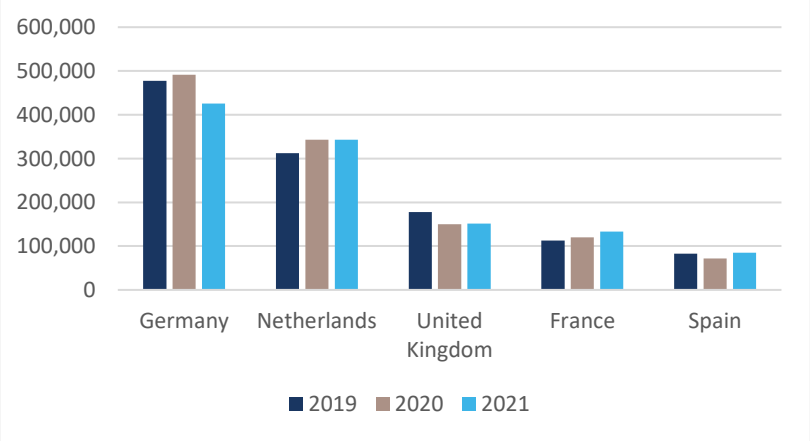
Unlike its rice counterpart, the European nut industry is not in the business of shelling cashews, apart from in a few rare cases, and thus virtually all cashews are imported in shelled form. European imports of shelled cashews represent around 36 per cent of global imports. The continuous climb in import quantity can be attributed in part to increasing consumer awareness of the healthy nutritional value of edible nuts in general and specifically in cashew nuts, which are becoming a substitute for other tree nuts like almonds and hazelnuts which are in shorter supply. The Table below also shows that cashew is the edible tree nut that is imported into Europe the most.

Table 32 Leading European edible tree nut imports from developing countries

	US$ million 2021	CAGR 2017-21
Cashew nuts, shelled	1,288.8	-3.6%
Hazelnuts, shelled	1,064.0	3.5%
Dried walnuts, shelled	358.4	0.2%
Other edible tree nuts	341.7	14.4%
Desiccated coconut	298.8	5.5%
Pistachios, shelled	191.7	14.1%
Pistachios, in shell	158.1	-1.5%
Macadamia nuts, shelled	122.6	15.8%
Brazil nuts, shelled	102.4	-6.2%
Walnuts, in shell	64.7	1.8%
Chestnuts, in shell	48.9	5.7%
Fresh coconuts	36.4	-3.5%
Almonds, shelled	28.9	4.7%
Hazelnuts, in shell	24.2	47.9%
Fresh coconuts in the inner shell 'endocarp'	19.7	21.3%
Chestnuts, shelled	4.3	22.2%
Almonds, in shell	2.3	-15.4%
Kola nuts	2.1	18.1%
Areca nuts	1.1	27.0%
Cashew nuts, in shell	1.1	-12.3%
Macadamia nuts, in shell	0.8	-23.9%
Brazil nuts, in shell	0.4	-30.6%
Cashew nuts, shelled	1,288.8	-3.6%

Source: Trade Map

Figure 2 Leading Importers of shelled cashew nut in Europe (EU + UK) (US$'000)

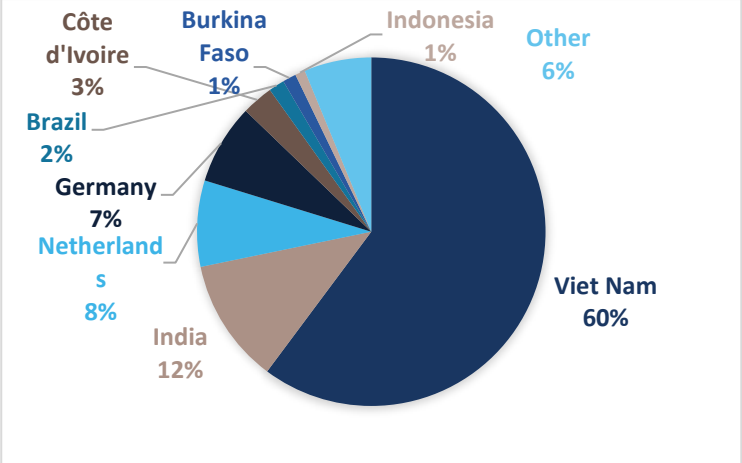


Source: Trade Map

Germany and the Netherlands together take a big chunk of the market, accounting for almost 50 per cent of total European imports in 2021. Both countries are big consumers of cashew nuts and they are also transit countries for other European destinations. The Netherlands is an important trade hub for the re-export of cashew nuts within Europe, re-exporting approximately 75 per cent of its imports to other countries across the continent.

Although their markets are significantly smaller, several Central and Eastern European countries have shown rapid growth in cashew imports including Poland (compound annual growth rate (CAGR) 9 per cent over 2017–21), Czech Republic (8 per cent) and Lithuania (10 per cent). These markets will offer good opportunities for new players – like Cambodia – in the shelled market because of less competition.

Figure 15 Leading Suppliers of shelled cashew nut to Europe (EU + UK), 2021



Source: Trade Map

Holding its position as the shelling centre of the world, Vietnam is Europe's leading supplier of cashews by far, with more than a 50 per cent market share. India is a similar stronghold for cashew shelling in the world, but its smaller market share in Europe reflects relatively fewer exports than Vietnam, given its need to feed into India's own colossal market. Vietnam and Cote d'Ivoire have been the main supplying countries to fill the void left by the decreasing supply from India. In terms of re-export within Europe, Germany has really established itself as a European hub for edible nuts evident, also from its impressive growth in intra-EU exports since 2011 at the same time as being the leading importer.

In the long-term, it is expected that European imports will diversify away from the current over-dependence on Vietnam as a supplier, partially triggered by issues related to breaches of contract. As Vietnam is a main sheller in the global business, buying from that country also: (a) makes traceability very challenging (hence a major risk as markets become more and more dependent on this single source); and (b) adds heavily to a carbon footprint with RCN first being shipped all the way across the world to Vietnam and then all the way back to reach the market in Europe. Imports are forecasted to shift partially towards African countries. With the cost of cashew processing technology dropping, new investments in processing capacity are expected in all production countries, but especially in Africa. Investors are interested because of good cashew prices in previous years, yielding higher profits than other commodity crops.

5.4.2 European cashew nut consumption characteristics and trends

Cashew consumption replacing other tree nuts. Over recent years, cashew consumption has grown as a substitute for almonds, hazelnuts and pistachios, which have been in short supply and, therefore, more expensive. European consumption growth is expected in the long-term, driven by increasing consumer awareness of the nutritional value of cashew nuts.

European consumers prefer salted, roasted cashews over other nuts. The average European consumer favours the taste of salted, roasted cashew nuts over the taste of most other nuts.

W320 is the main size. Broken nuts are not popular. Europe imports mainly W320, some W450 and W240.[17] Broken nuts are not popular, perhaps with the exception of LWP (Large White Pieces) for mixes. Use in confectionary and bakery products has not taken off. This poses a bit of a problem as Cambodian cashew is larger in kernel size.

[17] **W – signifies 'whole' nuts vs. broken and 320, 450 etc. refers to standardised sizes**

Celebrity chefs are doing their part in promoting cashews. Celebrity chefs like Jamie Oliver are increasingly using cashew nuts in their recipe books and TV shows, influencing consumer choices for shopping ingredients.

Flavoured cashews are also popular. Flavoured and coated cashew nuts are gaining in popularity in Europe. Most popular flavours include jalapeño, hot-spicy and tamari-roasted.

Increase in edible nut consumption for health reasons. Because nuts contain 'heart-healthy' fats, minerals and vitamins, European consumers incorporate them into their daily diet as healthy snacks and an alternative to crisps and extruded snacks. Consumption of edible nuts is expected to have the highest growth within the European snack segment. Among the nuts, cashews, along with others like almonds, walnuts, macadamia and Brazil nuts, are considered a healthier alternative to peanuts.

Healthy food ingredient. Cashew nuts are also becoming an ingredient in various healthy food products, such as breakfast cereals (e.g., Qnola and Paleofood) and cashew nut butter (e.g., Meridian and Pip&Nut).

Vegetarian lifestyle is gaining in popularity. The proportion of Europeans who follow a vegetarian diet reached 5 per cent in 2016 (Statista). This percentage can be expected to grow in years to come as European consumers become increasingly aware of the fact that feeding animals and consuming meat is becoming unsustainable for the planet. At the same time, this trend is not limited to veg(etari)ans, as European consumers in general are increasingly interested in plant-based alternatives. They are replacing dairy milk with almond, cashew and other milks. Cashew is a highly used ingredient for plant-based cheese.

5.4.3 European cashews – standards

General marketing, quality and packaging standards

The most widely used standard for cashew nuts is the classification by the United Nations Economic Commission for Europe (UNECE). This standard is, for example, applied in Europe, but it is also the basis of the USDA (American) standard for cashew nuts. The UNECE standard recognises a few categories/subcategories:

- Whole: whole kernels of characteristic shape, with more than 7/8th of the kernel intact.
- Brokens: kernels where 1/8th or more of the original kernel is broken off. The designations of brokens are: 1) Butts: kernels of not less than 3/8th of a kernel, which have been broken crosswise, but the cotyledons are still naturally attached; 2) Splits: kernel split lengthwise naturally, provided that no more than 1/8th is broken off; 3) Pieces: kernels that have broken into more than two pieces.

Within these categories, UNECE lists certain minimum requirements, including that the cashews:

- Are sound (i.e., not affected by rotting or deterioration).
- Are free from damage affecting appearance, clean (i.e., free from visible foreign matter and living pests), free from damage caused by pests, and free from spots in aggregate in excess of 3mm on the kernels.
- Have a maximum moisture content of 5.0 per cent.

Cashew kernels are graded on the basis of the above categories, as well as on their class and size.[18]

5.4.4 Private standards

For dry products, GLOBALGAP, which is still a major obstacle for Cambodia to overcome, is not as crucial as it is for fruits and vegetables. European buyers do, however, frequently seek suppliers who have food safety management systems in place – IFS, FSSC 22000 and BRC.

18 Read the full UNECE at https://www.unece.org/fileadmin/DAM/trade/agr/standard/dry/dry_e/17CashewKernels_e.pdf. (Note that the main producing countries – India, Brazil and Vietnam – also have a national classification in place which may be slightly different here and there. ASEAN has also developed its own standard – https://asean.org/storage/2012/05/20-ASEAN-STANDARD-FOR-CASHEW-KERNERLS-2011.pdf

Sustainability and corporate social responsibility initiatives are becoming increasingly important in the production of cashew nuts. The Competitive Cashew Initiative19 and the Sustainable Nut Initiative20, as indications of this movement, are clear evidence of this.

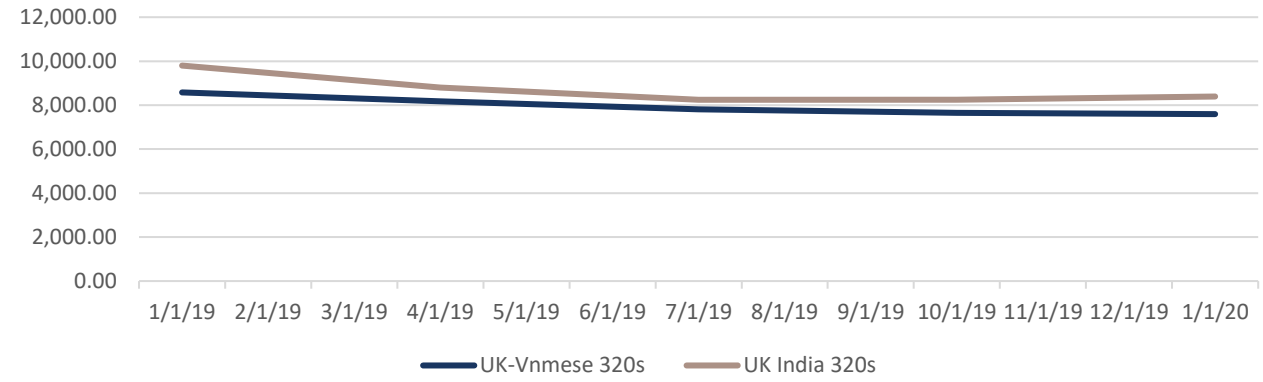
Recommendation: Cambodian exporters should monitor this trend closely and consider working on a socially responsible image by, for example, participating in platforms like SEDEX. During the transition phase to becoming competitive in shelled, and convincing the buying world to be patient, portraying socially responsible values will be a great help.

Organic certification is also an important consideration especially given that there is no trade-off of a reduction in yield against a premium price as there is in other crops like rice. Exporters should note that, for the European market, beyond getting internationally recognised certification, the EU does also have some rules on importing organic products from third countries. Commission Regulation (EC) No. 1235/2008[21] details the rules that are mainly about organic labelling.

Recommendation: Cambodian cashew promoters should remain aware of the fact that there is not enough organic certified cashew on the market.

European cashew prices

Figure 16 Kernel spot prices UK EXW (US$/ton)



Source: Public Ledger

Table 33 Kernel shipment, FCA Holland (US$/ton)

Date	$/ton
01/01/2020	**8,818.49 Mozambiquan 320s**

Source: Public Ledger

5.4.5 European trade fairs for cashews

- Food Ingredients Europe
- Fruit Logistica
- Biofach
- SIAL
- ANUGA
- Fruit Attraction

19 https://www.giz.de/en/worldwide/19011.html

20 https://www.sustainablenutinitiative.com/

21 https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32008R1235

5.4.6 Prospective European business partners – cashew

CBI, Netherlands, provides an excellent list as follows:

Importers: Examples of importers of cashew nuts in leading European markets include the following: Märsch Import (Germany); August Töpfer (Germany); nutwork Handelsgesellschaft (Germany); Acomo Group (Netherlands and Germany); Nutland (Netherlands); Amberwood Trading (Netherlands); Besana (Italy and United Kingdom); Barrow, Lane & Ballard (United Kingdom); T.M. Duche & Sons (United Kingdom); Freeworld Trading (United Kingdom); Voicevale (United Kingdom, Germany and France); and Midi Sec (France).

Agents: Examples of cashew nut agents in the leading European markets include the following: Hpm Warenhandelsagentur (Germany); MW Nuts (Germany); Global (Netherlands); QFN (Netherlands); and Nutfully (Belgium).

5.4.7 Processors and packers

- Intersnack — headquartered in Germany but active in several countries;
- Seeberger — retail snacks, Germany;
- Maryland — retail snacks, Germany;
- Duyvis — retail brand owned by PepsiCo, Netherlands;
- Ireco — roasting company, Luxembourg;
- Humidinger — retail snacks, United Kingdom;
- Crazy Jack — organic retail snacks owned by Community Foods, United Kingdom;
- Noberasco — retail snacks, Italy;
- de Smaakspecialist — producer of snacks including cashew nut butter, Netherlands;
- Alnatura — organic food company, Germany;
- Meridian Foods — producer of nut bars and nut butters, United Kingdom.

5.5 Cashews – China

5.5.1 Chinese market opportunities and insights for cashew nuts

Table 34 Leading edible nuts imported by China, 2021 (US$ m)

	2021 Import USD million	CAGR 2017-21
Pistachios, in shell	612.128	36%
Other tree nuts	477.637	16%
Fresh coconuts in the inner shell ‘endocarp’	401.226	25%
Dried almonds, in shell	203.862	70%
Macadamia nuts, in shell	172.852	20%
Almonds, shelled	169.133	24%
Cashew nuts, shelled	162.999	37%
Hazelnuts or filberts, shelled	34.437	6%
Macadamia nuts, shelled	31.742	35%
Desiccated coconuts	29.845	8%
Hazelnuts, in shell	17.296	55%
Chestnuts, in shell	14.642	-10%
Cashew nuts, in shell	11.825	0%
Areca nuts	11.158	94%
Walnuts, in shell	9.825	-11%
Walnuts, shelled	5.767	-25%
Pistachios, shelled	4.462	8%

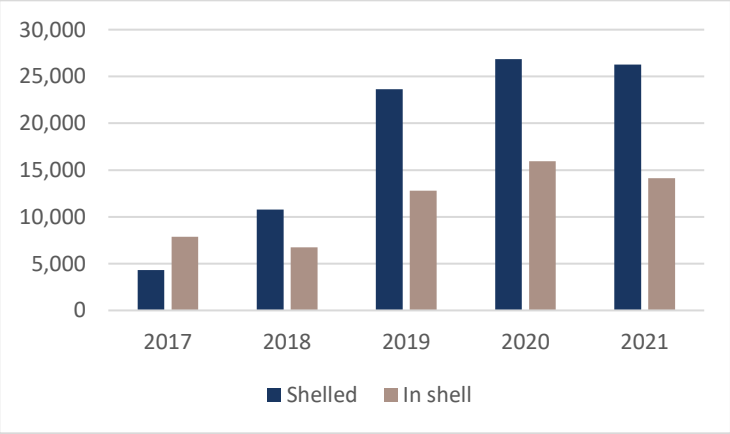
Source: Trade Map

The fact that China is a leading world producer of walnuts (1mln MT), almonds (45,000 MT), hazel nuts (45,000 MT) and melon seed (MT), should also be taken into account to complete the picture (USDA, FAOSTAT, Statista).

As one of the most popular healthy snacks, nuts perfectly fit rising demand for healthy eating among Chinese consumers. Accordingly, the edible nut market has been growing rapidly for several years in China. Cashews have been part of this surge, although the Chinese do prefer pistachios, almonds and pecans. This is reflected in China's edible nut import figures. In other markets – like Europe – cashews are by far the most imported nuts (apart from peanuts which are in a different price category). Nevertheless, Chinese cashew imports are still substantial. In fact, in 2019, shelled cashew imports reached US$165m. This rapid rise is not so much a real rise in consumption – and consequently imports – but rather a reflection of imports from Vietnam switching from informal to formal channels, under pressure from the Chinese Government that is clamping down hard on grey channels. The cashew experts spoken to for this report estimate the amount of CN to be higher still, i.e., the grey channel is not yet entirely closed.

Vietnam accounts for virtually all (95 per cent) of China's imports of shelled cashew nut. As a major hub in the world for shelling cashews, Vietnam accumulates RCN from many sources – mainly Africa and Cambodia. It is surprising that China has not yet fully jumped into the role of buying and then shelling RCN for its own market and still buys mainly shelled. We can see, however, a change creeping in already if we look at the quantity of imports over 2018–20, RCN compared with CN, in the graph below. This shows Chinese RCN imports tripling from 6,757 MT to 15,947 MT in two years. China's imports of RCN are mainly from West Africa (Mali, Togo and Benin) and some 4,000 MT from Cambodia.

Figure 17 Official Chinese imports of shelled and in-shell cashew nuts 2017-21, tons



Source: Trade Map

5.5.2 Chinese cashew nut consumption trends and characteristics

Refer to the Chinese Market for Dried Fruits and Nuts – under Mango Chapter 3

5.5.3 Tariff Advantage and prices

Table 35 Chinese CIF import prices US$/kg

	2019	2020	2021
Vietnam	**7.04**	**5.72**	**6.49**
Cambodia	**8.27**	**5.89**	**6.79**

Source: Trade Map

Table 36 Cashew – comparative tariff advantages

Code	Tariff	Regime	Exporting Country
China			
080131 - cashew in shell	20.0%	MFN	Nigeria, Cote d'Ivoire
	0.0%	ASEAN-China FTA	Vietnam, Cambodia
	0.0%	China: Asian LDCs	Cambodia
	0.0%	China: Afrivcan LDCs	Mali, Togo, Benin
080132 - cashew, shelled	10.0%	MFN	India, Nigeria, Cote d'Ivoire, Ghana
	0.0%	ASEAN-China FTA	Vietnam, Cambodia
	0.0%	China: Asian LDCs	Cambodia
	0.0%	China: Afrivcan LDCs	Tanzania

Source: Market Access Map

As China starts to increase its import of RCN, it is of value to note that Cambodia faces an advantage of 20 per cent in tariffs compared with other suppliers like Nigeria and Cote d'Ivoire.

Although, for CN, the key competition for Cambodia in the Chinese market is Vietnam, there is also a 10 per cent tariff advantage against some African suppliers who are now also starting to process cashew nuts. Beyond that, Cambodia also has the advantage of proximity.

5.5.4 Relevant trade fairs in China and importers of cashews

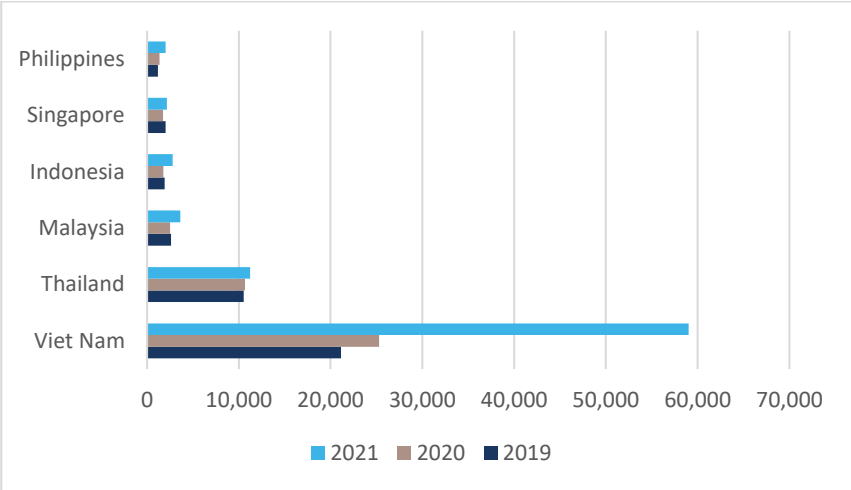
- IFE China
- SIAL China
- FBIE Shanghai
- ANUFOOD China
- FHC China

Table 37 Chinese importers of cashew nuts

Sunshine (Tianjin) Produce Limited	http://www.sunshineproduce.com.cn
Suzhou Joywell Taste Co.,Ltd	**http://www.soyabeansnacks.com**
Shandong Tianqiu Import and Export Co., Ltd	**https://sd-tianqiu.en.made-in-china.com**
Wuhan Lechi Import and Export Co., Ltd.	**http://www.resourcesinchina.com/23531/about/1.html**
Sabava	**http://sabavachina.com/?l=en**
Shanghai Laiyifen Co., Ltd.	**https://www.laiyifen.com/**
Be & Cheery	**now acquired by Pepsi Co**
Three Squirrels	**http://www.3songshu.com**

5.6 Cashews – ASEAN

Figure 3 Leading importers of shelled cashew in ASEAN 2019-21 (US$'000)

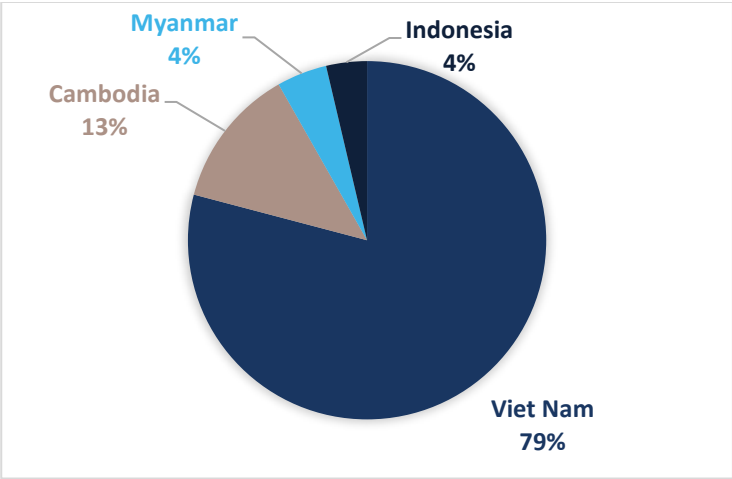


Source: Trade Map

The leading importers of shelled cashews within ASEAN are Vietnam and Thailand. In the case of Vietnam, the imports reflect part of the bigger picture of the country, given that it is a major conduit to the global market and thus will also buy shelled as well as unshelled from Africa.

Thailand can be seen as more of a consumption-import market. The Thai picture is, however, still rather complicated as the country is also a producer and exporter. In addition, part of its trade comprises the export of RCN to Vietnam and then the import of the processed CN, as Thailand has limited shelling capacity. Nevertheless, the country is a significant net-importer. In 2019, imports were worth US$71 million, and amounted to 10,540 MT. Vietnam is its major supplier, accounting for about 79 per cent in 2021. Indonesia is starting to gain some market share. Since 2019, Cambodia has also become a supply source, reaching 1,400 MT in 2021.

Figure 19 Leading suppliers of shelled cashew to Thailand (2021) (US$'000)



Source: Trade Map

The imports feed into a vibrant snack market, but cashew is also an important ingredient in Thai cuisine, and other food processing segments include the thriving confectionary, biscuits and rice crackers sectors, as well as a growing ready-made meal export industry.

However, the most important segment is retail snacks. A rough estimate, using almonds as an example, shows almond imports at 6,000 MT in 2021. Around 10 per cent of that is used to produce almond milk, cookies, and so on. The remaining 5,400 MT goes into the snack industry. Across the spectrum of brands on

sale it would be fair to say that, in the single nut and mixed ranges, cashews and almonds constitute similar proportions. Therefore, a reasonable estimate would put the size of this snack segment in cashews at around 5,400 MT, in other words, approximately 50 per cent of imports which in 2021 were 11,000 MT.

Heritage Snacks Food Corporation is the giant in the sector, owning the Heritage and Nut Walker brands as well as the licence to pack international brands including Blue Diamond Almond and Sunkist. Thong Garden (originally Singaporean) and Koh-Kae are two other main players in the market. According to the *Bangkok Post*, Heritage Snacks also has a large export operation serving more than 60 countries. In addition, it owns plantations in Ranong, Laos and in several African countries.

Thai consumers are becoming increasingly aware of issues such as obesity and are seeking to eat more healthily. This also applies to snacks. Their increasing awareness of the nutrient content of nuts and seeds is boosting the popularity of nuts, seeds and trail mixes. As demand grows, the leading brands are adding assortments to their ranges to add interest and drive sales. Their distribution is well spread across the country's large number of retail outlets including a vast array of convenience store franchises.

5.6.1 Prices and comparative tariff advantages

Table 38 Average Thai CIF prices for shelled cashews (US$/kg)

	2019 CIF, US$/Kg	2020 CIF, US$/Kg	2021 CIF, US$/Kg
World	7.51	6.19	5.83
Vietnam	7.41	6,24	6.25
Cambodia	8.40	4.59	3.56
Indonesia	8.86	7.82	7.29
Myanmar	7.49	6.02	3.71

Source: Trade Map

Table 39 Thailand shelled cashews

%		Country
40.0%	**MFN**	
0.0%	**ASEAN**	**Vietnam, Indonesia, Myanmar, Cambodia, Laos**
13%	**ASEAN-India FTA**	**India**
0%	**LDCs**	**Tanzania**

Source: Market Access Map

5.6.2 Trade fairs and importers of cashews

- Thaifex
- SIMA ASEAN Thailand
- FI Food Ingredients Asia

Table 40 Thai importers of cashew

Importer	Website
Heritage Snacks & Foods Company Limited	**www.heritagethailand.com**
Mae-Ruay Snack Food Factory Company Limited	**www.koh-kae.com**
Tong Garden Company Limited	**https://www.facebook.com/TongGardenThailand/**

5.7 Cashew - Japan

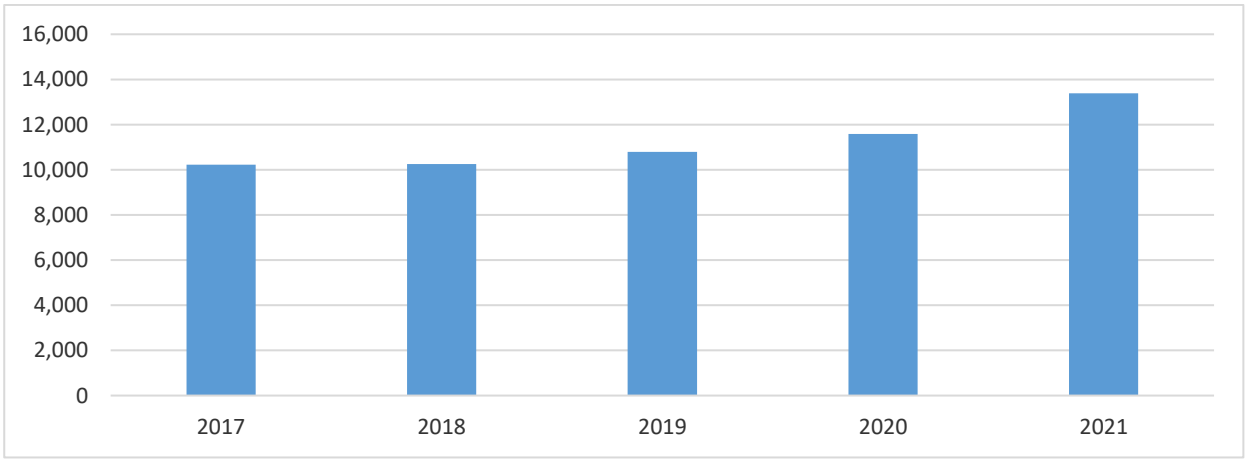
5.7.1 Japanese market opportunities and insights for cashew nuts

Table 41 Top 10 edible tree nuts imported by Japan (2021)

	Import (US$ million)	CAGR 2017-21
Almonds, shelled	220.6	-0.2%
Walnuts, shelled	131.4	-2.7%
Cashew nuts, shelled	102.2	-1.3%
Macadamia nuts, shelled	48.4	5.7%
Chestnuts, shelled	23.6	-6.5%
Pistachios, in shell	21.4	17.6%
Pistachios, shelled	20.8	28.8%
Coconuts, dried	13.2	9.5%
Hazelnuts, shelled	8.7	1.1%
Chestnuts, shelled	6.7	-11.3%

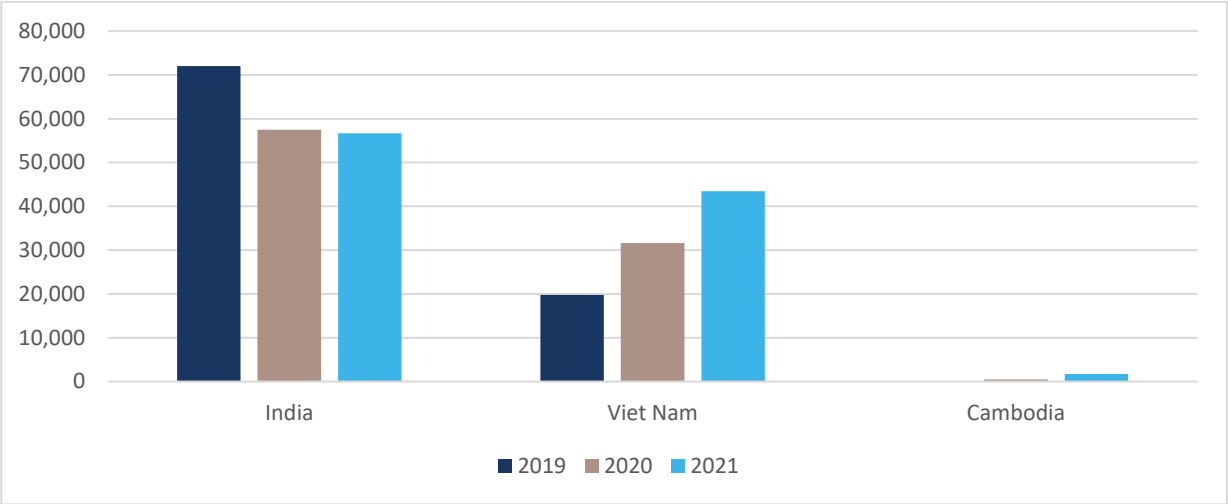
Source: Trade Map

Figure 20 Japanese imports of cashew (MT)



Source: Trade Map

Figure 21 Japanese imports of cashew – main supply sources (US$'000)



Source: Trade Map

5.7.2 Trends

In the retail sector, mixed nuts sell best among the categories of nuts (including peanuts), followed by peanuts and chestnuts. In recent years, **Japanese consumers have become more health-conscious and have become better educated about the nutritional benefits** of both almonds and walnuts. Strategic marketing and promotion of the health and beauty benefits by major television stations, as well as on internet and social media sites, have continued to be effective. Health-related messaging includes key words like omega-3, antioxidant, vitamin E, vitamin B, minerals, oleic acid, anti-aging, cholesterol reducing, zero cholesterol, healthy blood vessels, healthy brain, healthy skin, etc. This type of messaging has been key to promoting nuts and nut products to Japanese consumers.

Although the **online retailing** for food and beverages is not as yet a big segment in Japan, it is developing rapidly (IBER Global, 2016). Many major supermarkets now offer online grocery services in most parts of Japan.

Although demand for **organic food** is relatively small in Japan, consumer interest is slowly growing and there could be vast opportunities for suppliers provided that they can meet Japan's stringent standards (www.food-navigator-asia.com).

5.7.3 Price and Tariff advantages

Table 42 Average Japanese cashew CIF import prices, US$/kg

	2019	2020	2021
India	9.13	8.52	8.27
Vietnam	7.06	6.66	6.90
Cambodia		11.56	12.00
Indonesia	10.33	6.33	8.45

Source: Trade Map

Higher prices paid for Cambodian cashew are most likely to be connected to a Japanese cashew processing joint venture that has achieved organic certified processing.

Table 43 Import tariffs applied by Japan – cashew

MFN	25%	India
ASEAN	3%	Cambodia, Indonesia, Vietnam
RCEP	0%	Cambodia, Indonesia, Vietnam

Source: Market Access Map

5.7.4 Trade Fairs

- FOODEX Japan 2023, March 7-10, 2023, Tokyo Big Sight, Tokyo
- FABEX Kansai 2022, September 7-9 2022, Intex Osaka, Osaka
- FABEX Kansai is for the food market in Kansai area and west of Japan
- Supermarket Trade Show 2023, February 15-17, 2023, Makuhari Messe, Chiba

5.7.5 Importers

The Japan Nut Association represents the interests of wholesalers, processors, and trading firms. Their member list can be found at http://www.jna-nut.org/?page_id=16

5.8 Cashew – South Korea

5.8.1 South Korean market opportunities and insights for cashew nuts

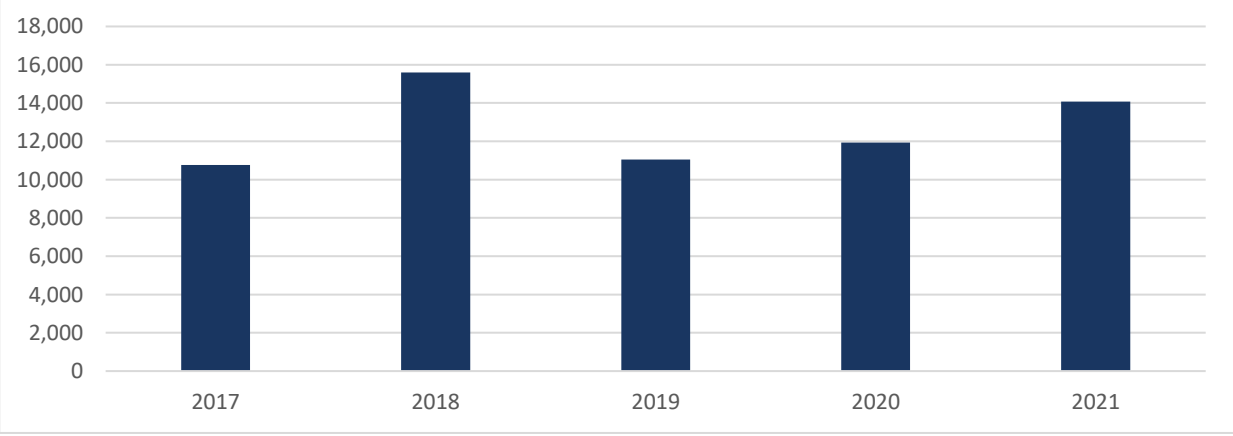
The South Korean import market for edible tree nuts is worth some US$400m. A very new market since the country only recently opened access for edible nuts, back in 2002 imports were worth less than US$30 million. Almonds and walnuts make up more than half the imports, with cashew following but with significantly less. In recent years, strong growth (in value terms) can be witnessed in imports especially of macadamia and shelled pistachio. As is the case elsewhere in the world, supply disruptions, as a result of the COVID pandemic, appear to have affected quantity imports over 2019 and 2020, but recovery became apparent in 2021. South Korea does not have cashew shelling capacity and therefore cashew is imported only in shelled form.

Table 44 Top 15 edible tree nuts imported by South Korea (2021)

Product label	Million USD	CAGR 2017-21
Almonds, shelled	182.196	1.5%
Walnuts, shelled	98.108	-2.5%
Cashew nuts, shelled	32.82	0.5%
Brazil nuts, shelled	19.614	-17.4%
Macadamia nuts, shelled	18.641	12.0%
Other nuts	17.174	8.3%
Pistachios, in shell	7.614	6.0%
Hazelnuts, shelled	6.117	6.3%
Chestnuts, in shell	5.408	7.8%
Pistachios, shelled	5.141	19.0%
Desiccated coconuts	4.532	-4.0%
Fresh coconuts	1.871	4.7%
Walnuts, in shell	1.485	-6.7%
Fresh coconuts in the inner shell 'endocarp'	0.689	56.5%
Mixtures of nuts or dried fruits	0.255	-3.6%

Source: Trade Map

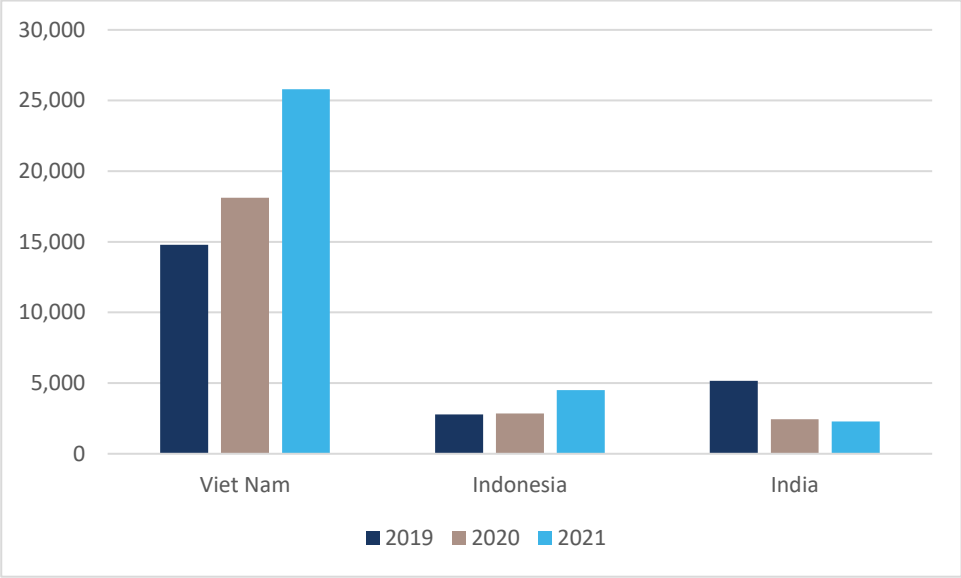
Figure 22 South Korean imports of shelled cashew (MT)



Source: Trade Map

Vietnam has a strong and growing grip on the South Korean market, along with India and Indonesia. Vietnam's gains on the market have been at the cost of India, currently losing market share. India's 25 per cent additional import duty (see below), compared with Vietnam's, is most likely to blame for this. Since 2018, Cambodia has started to supply very small quantities to South Korea.

Figure 23 South Korean imports of shelled cashew – main supply sources (US$'000)



Source: Trade Map

Korean retailers prefer to import raw products and process them in-market. The majority of imported nut products are locally packaged. Nuts were traditionally targeted at beer drinkers but there has been a greater awareness of the health benefits of nuts, making them particularly popular with young females. More single-portion options are becoming available to cater to this market (via online shopping), and CJ Cheil Jedang has the largest share of Korea's snack-nut market.

5.8.2 Trends

Online retailing of fresh produce is taking off in South Korea in response to growing demand from consumers. The online grocery market is expanding in South Korea, with demand for delivery services rising among young people living alone, and childless couples. Both demographic groups are growing in Korea (Fruitnet.com). According to the Korea Statistics Office, online food and agricultural sales in Korea increased by 61 per cent in 2020, compared with 17 per cent growth in overall online retail sales. Healthy snacks are hot items to include in online ordering.

Sensitivity to safe and healthy food products – South Korean consumers' ever strengthening interest in, and sensitivity about, safe and healthy food products is a well-established trend. Used in their everyday language, the term 'well-being food' refers to food products or ingredients that are advertised as having functional health benefits. The trend is a strong driver for the continued heavy demand for products with great health benefits. As healthy snacks, edible tree nuts fall fully in line with this trend.

Vegetarianism/Veganism

A recent study found that only 0.2 per cent of South Koreans do not eat meat or fish, and the percentage who eat vegan food is even lower (according to a report from the Korea Agro-Fisheries and Food Trade Corporation). However, starting from a very small base, veganism as a trend is actually picking up. Cashew is an important ingredient for many vegan foods, especially plant-based cheese. Yangyoo

(https://www.yangyoo.com/en/) is a Korean food technology company that is striving to become a global player in vegan plant-based cheese products.

5.8.3 Price and Tariff advantages

Table 45 Average South Korean CIF import prices – shelled cashew

	2019	2020	2021
Vietnam	8.06	6.87	7.01
Indonesia	7.76	6.75	6.46
India	8.47	8.09	8.61

Source: Trade Map

Table 46 Import tariffs applied by South Korea on shelled cashew

MFN	25%	India
ASEAN	0%	Cambodia, Indonesia, Vietnam
RCEP	0%	Cambodia, Indonesia, Vietnam
Korea-Vietnam FTA	0%	Vietnam

Source: Market Access Map

5.8.4 Trade Fairs

- Seoul Food 2022 - International Food Industry Exhibition
- Bofood (Busan International Food Expo)
- Food Week Korea

5.8.5 Importers

Company	Website
CJ Cheil Jendang	**http://www.cjfreshway.com/en/index.jsp**
Busan Agri Ltd	**https://www.listofcompaniesin.com/Busan_Agri_Ltd_Company_2968800.html**
Jinhwa Trade Co., Ltd.	**http://www.jhtrade.co.kr/**

6 Chilies

6.1 Product Definition

Dried chilies can be naturally sun-dried or dehydrated in hot air circulation tunnels. Dried chilies are produced in different forms, but there are three main ones: as a whole; crushed flakes; and ground powder. Crushed or ground chilies can be produced with or without seeds.

A commonly traded chili is the bird's eye variety, *capsicum frutescence*, which is grown in the higher altitude parts of eastern Cambodia. Several traders have fulfilled orders from Italy. CAVAC has developed a model farm and provided trainings for growers to improve production and quality. Bird's eye is the more commonly traded dried chili as it has a high level of hotness.

Trade in fresh chilies also exists, and other varieties may be suitable for that. Cambodian producers currently produce the *capsicum annuum* variety of chili in the west of Cambodia for direct supply as fresh to Thailand.

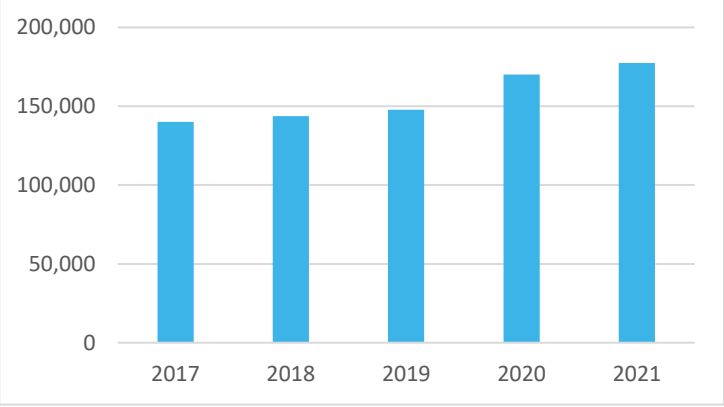
Table 47 Trade data classification

	Code	Label
EU	**09042190**	**Dried chili fruit**
	09042200	**Dried flakes and powder (incl. paprika)**
	07096099	**Fresh chilies**
ASEAN	**09042110000**	**Dried chili fruit**
	09042210000	**Dried chili fruit**
	07096010000	**Fresh chilies**

6.2 Chilies – Europe

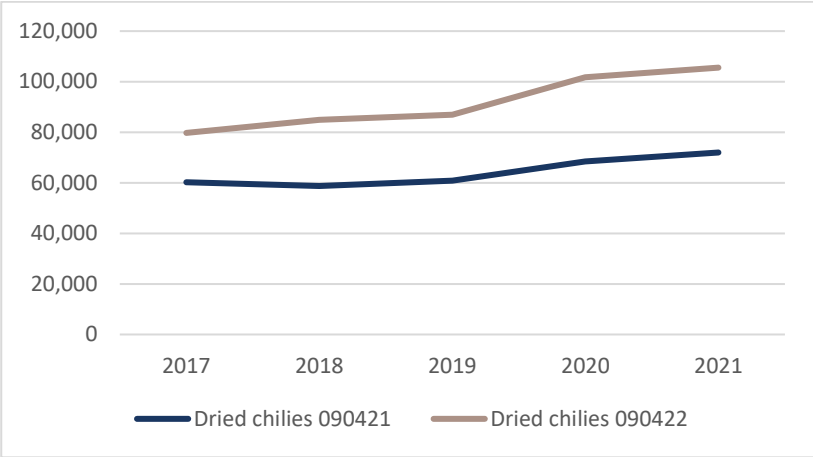
6.2.1 European market opportunities and insights for dried chilies

Figure 4 European (EU + UK) imports of dried chilies, 2017-21 (tons)



Source: Trade Map

Figure 25 Europe (EU + UK) imports of dried chili by type (tons)



090421 Fruits of the genus *capsicum* or of the genus *pimenta,* dried, neither crushed nor ground (whole fruit)
090422 Fruits of the genus *capsicum* or of the genus *pimenta*, crushed or ground (powder and flakes)

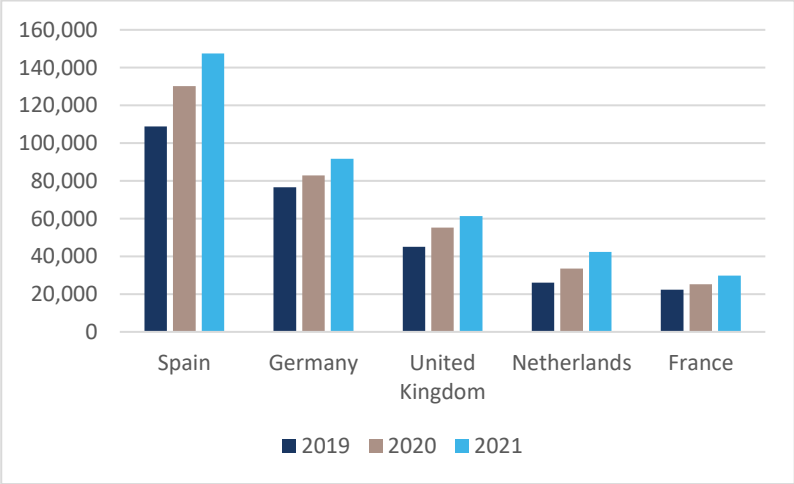
Source: Trade Map

In Europe, chilies are no bagatelle, with imports of dried chili and paprika reaching 177,000 MT in 2021, up from 116,000 MT in 2014, with a steady increase over those years. It should be noted that this figure covers all imports i.e., it includes intra-EU re-exports, so the real figure will be somewhat lower than this considering that a significant proportion originates from outside Europe. Nevertheless, those are large volumes amounting to approximately 20 per cent of world imports.

An important factor to note regarding the trade in dried chilies in Europe, is that, within Europe, there are also producers, the main ones being Romania (45,000 MT), Hungary (20,000 MT) and Spain (4,000 MT).

Trade classification makes a distinction between flakes and powder (crushed or ground) and the whole dried chili fruit. The flakes and powder go directly into seasonings, while the whole fruit undergoes more processing, especially for the production of sauces. Imports of the powder and flakes are more significant and are increasing. The whole fruit import is also gradually increasing, reflecting the state of the global hot-spice sauce industry which is experiencing a positive trend.

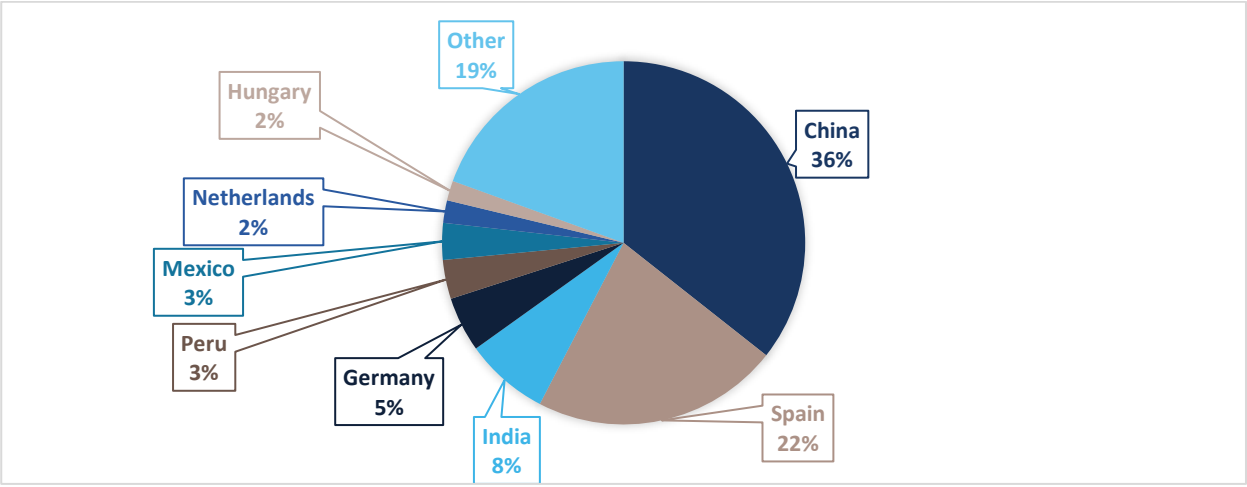
Figure 26 Leading importers of dried chilies in Europe (EU + UK) US$'000



Source: Trade Map

Spain is the largest market, accounting for a third of EU imports. Germany is also key, while the UK has a sizeable south Asian population who frequently cook with dried chilies. Spain is not only a major importer but also a big producer, blender and exporter.

Figure 27 Leading suppliers of dried chilies to Europe (EU+UK) 2021



Source: Trade Map

Of all the chilies, 80 per cent goes into the spice market for the meat and food industry, while around 20 per cent goes directly to the consumer. This also applies to mixes. The majority of chilies go to the spice market in powder form.

The chili industry is closely linked to paprika powder, which is a raw material for seasoning as well as for the colouring industry. In order to arrive at the right colour and taste profile for paprika powder, importers need to be operating at a large scale. Such players include Verstegen, Silvo, McCormick and Touton. There are very few producers that can supply consistently to meet the heavy demand: these companies are not looking for orders of 100 kilos as they have such high demand for large quantities.

Recommendation: The challenge, therefore, for dried suppliers of chili and paprika is the ability to aggregate efficiently and supply consistent quality.

Sustainable sourcing is an important trend in Europe, especially in the United Kingdom, the Netherlands and Germany, and suppliers are facing increasing requirements in respect of sustainability from their buyers. Many buyers see sustainable sourcing as vital.

Regular red chilies tend to be acquired from India.

Recommendation: When sourcing, it is important that a supplier is able to provide chilies that are standardised in terms of spicy-heat level. Additional factors are also important such as physical and micro-chemical parameters. If a supplier cannot standardise the 'heat' level, recipes would continuously have to be reviewed and amended. This makes the bandwidth of 'heat' essential. At Verstegen they use chilies between 30k and 40k on the Scofield scale.

Industrial processors make dry and wet mixes with the chilies. The form the chilies take (mashed, powdered or whole) does not necessarily affect the end product. It depends purely on what the mix/sauce is required for. If, for instance, pieces of chili are to be visible in a chili sauce, then the seeds need still to be visible and whole. Alternatively, if the product is a smooth Moroccan sauce, powdered chili is used.

The use of mashed and/or powered chili depends on the recipe. The seeds in the chili determine the heat and the pods determine the fruity flavour.

6.2.2 Standards

Marketing quality standards

UNECE has set a standard for dried chilies.[22] This covers minimum requirements, moisture content, classes, colour, pungency, sizing, packaging, uniformity and marking. It is, therefore, a very detailed standard. While

22 http://www.unece.org/fileadmin/DAM/trade/agr/standard/dry/dry_e/DDP24_WholeDriedChilliPepper_2013_e.pdf

this standard is not a legal requirement (apart from meeting the minimum requirements), it is the reference point for the industry.

Private standards

For processed crops, GLOBALGAP, which is still a major obstacle for Cambodia to overcome, is not crucial as it is with fresh fruits and vegetables. European buyers do, however, frequently seek their suppliers to have food safety management systems in place – IFS, FSSC 22000 and BRC.

Prices

Table 48 Average Spanish Import CIF prices for dried chilies, US$/kg

	2019	2020	2021
Dried chili fruit	2.01	2.01	2.16
Dried flakes and powder	1.55	1.52	1.71

Source: Trade Map

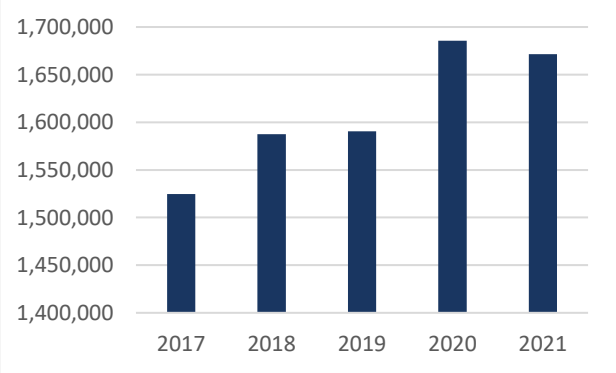
Flakes and powder collect lower prices in comparison with the whole dried chili fruit. There appears in both dried categories to be a gradual ascent in prices.

6.2.3 Key trade fairs

- Food Ingredients Europe
- Biofach
- SIAL
- ANUGA

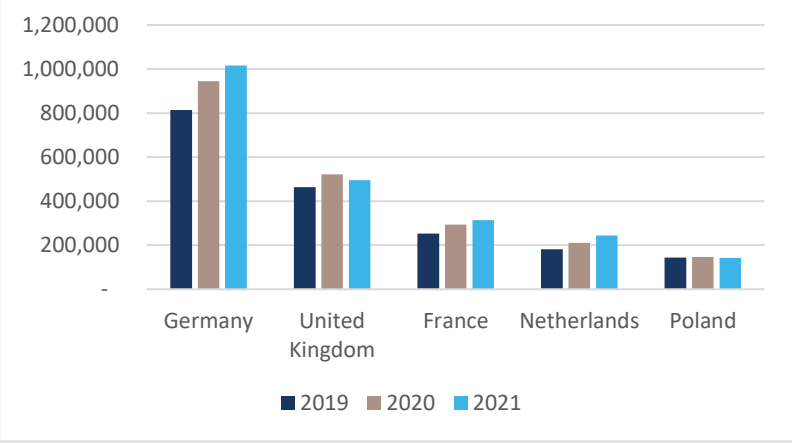
6.2.4 European market opportunities and insights for fresh chilies

Figure 28 European (EU + UK) imports of fresh chilies, 2017-21 (tons)



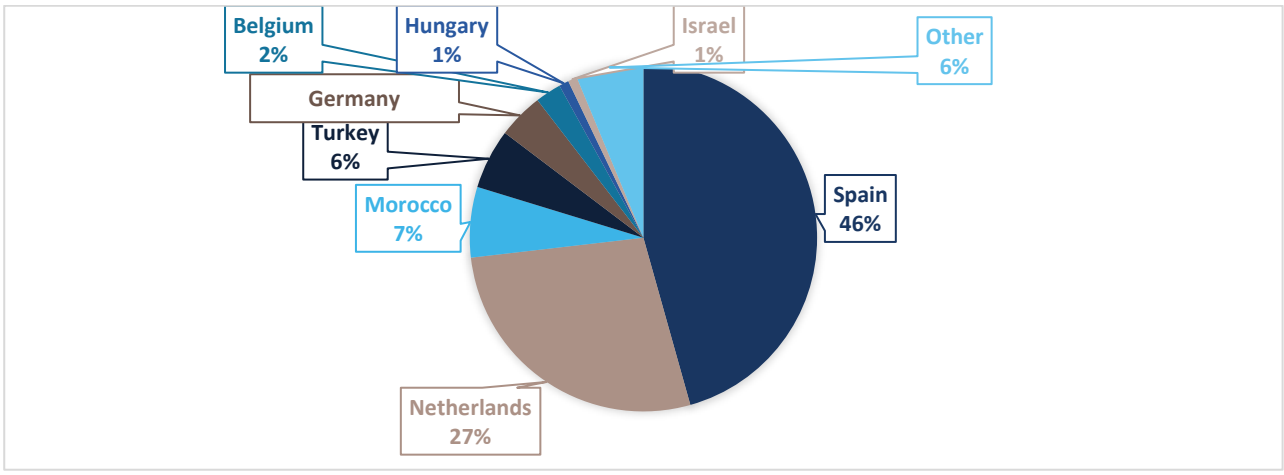
Source: Trade Map

Figure 29 Leading importers of fresh chilies in Europe (EU + UK), 2021 (US$'000)



Source: Trade Map

Figure 30 **Leading suppliers of fresh chilies to Europe (EU+UK) 2021**



Source: Trade Map

Traditionally, fresh chili in Europe is consumed by members of the population who, as a result of their ethnic backgrounds, are accustomed to the product and cooking methods. It is thus more popular in countries like the UK, which has a substantial population of immigrants from Southern Asia, and France, which has a significant North African population. In short, the growing ethnic populations in Europe drive the consumption of chili peppers.

However, other consumers are becoming more adventurous and trying out exotic ethnic cuisine dishes, which are often spiced-up with fresh chilies. European interest in cultural and fusion cuisines thus offers opportunities for suppliers of different varieties of chili peppers in addition to the common red and green peppers, such as the habanero, jalapeño, padron, rawit, rocoto, bird's eye, Madame Jeanette and ají amarillo.

Recommendation: Cambodian exporters can also consider experimenting with more exotic varieties than the currently limited range to cater to this growing market curiosity. The consumer trend of eating more exotic and international foods, leading to a spicier palate, is currently more relevant in fresh form from an Asian perspective, as dried exotic chilies are sought more from Peru. The Big List of Hot Peppers is a recommended source of information on the many hot varieties.

On the European market, fresh chili peppers are mainly imported by a relatively small number of importers specialising in tropical and exotic fruits and vegetables. In general, these importers trade in a wide range of fruits and vegetables, supplying outlets that focus on ethnic consumers or stocking the 'exotic shelf' in supermarkets with all sorts of produce.

The increased attention to health and the environment is also generating increased interest in organically produced fruits and vegetables. Although demand for organic chili peppers is relatively small, there are specialised channels, and further growth of the organic channel is expected.

There is great demand for certain varieties, but for some reason there are few constant and consistent suppliers. There is always a shortage of extremely hot varieties.

6.2.5 Standards

Marketing standards

UNECE has also set standards for fresh chilies.[23]

23 http://www.unece.org/fileadmin/DAM/trade/agr/standard/standard/fresh/FFV-Std/English/61_ChilliPeppers.pdf

Private standards

This study covers legal requirements for each of the relevant markets separately in Annex I. This includes hygiene and first-level food safety management – HACCP.

Common requirements

Food safety is a primary concern and, as such, most buyers, whose aim it is, in turn, to reassure their customers, will very likely request additional guarantees to legal requirements in the form of certification. The most commonly requested certification for fresh chili is GLOBALGAP, which covers practices at the pre-farm-gate level. As this is vital for most supermarket chains it is unavoidable, even though it is not a legal requirement for suppliers to enter the market. The insistence on GLOBALGAP certification is, however, dependent on the location within Europe: in Southern and Eastern Europe it is less of an absolute priority.

Recommendation: A major priority for Cambodian fresh chili producers is the speedier adoption of GAP in Cambodia.

Food safety management systems (post-farm-gate), frequently requested and well recognised, that go beyond simply adhering to HACCP principles, include IFC, BRC, SQF and FSSC22000.

Niche requirements

Requirements for niche customers include certifications, such as the one relating to 'organic'.

The market for organic chili peppers is relatively small, but demand is growing and there is a limited supply. In order to market organic products in the EU, organic production methods must be adopted according to European legislation.

In addition, an import authorisation must be acquired from organic control bodies. After an audit conducted by an accredited certifier, the EU organic logo should be placed on products, as well as the logo of the standard holder, such as the Soil Association (especially relevant in the United Kingdom), Naturland (Germany) or BioSuisse (Switzerland). These standards can differ slightly, but they all comply with the European legislation on organic production and labelling.

There is growing attention in Europe on the social and environmental conditions in crop production areas. Most European buyers have a social code of conduct, which they expect suppliers to adhere to. For chili peppers, it is important for suppliers to adopt social and environmental standards, and for most large retailers, it is crucial. The United Kingdom, the Netherlands and Germany are the most demanding, but the rest of Europe is expected to follow these three countries.

Responsible suppliers of chili peppers can indicate that their credentials have been acquired through: GRASP,[24] a social add-on to GLOBALGAP and an accessible certification that is gaining importance in Europe; SMETA,[25] which stands for the Sedex Members Ethical Trade Audit, and was developed by the non-profit member organisations of Sedex with the objective to facilitate the exchange of information on social compliance; and SIFAV, which is an initiative from traders and retailers that indicated their determination to become 100 per cent sustainable in sourcing fresh produce from Latin America, Africa and Asia by 2020.

Actual 'Fairtrade' labels are not common in the chili pepper trade and have generally lost some popularity in fresh trade because of their high cost and complexity.

6.2.6 Prices of fresh chilies

Table 49 UK CIF prices for fresh chilies (US$/kg))

	2019	2020	2021
World	2.37	2.39	2.42
Netherlands	2.41	2.51	2.51

24 **http://www.globalgap.org/grasp**

25 **https://www.sedexglobal.com/products-services/smeta-audit/**

Spain	1.99	1.89	2.04
Turkey	3.31	3.52	2.2
Morocco	2.4	2.49	2.59
Kenya	3.06	3.44	3.99

Source: Trade Map

6.2.7 Key trade fairs and prospective importers

- Biofach
- SIAL
- ANUGA

Table 50 Prospective importers

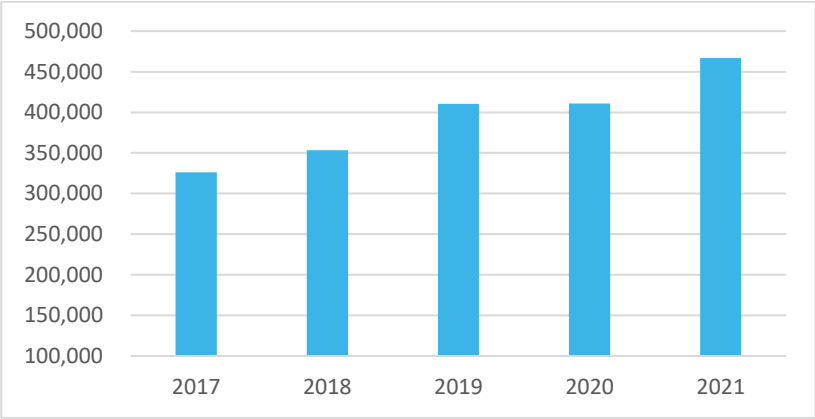
Importer	Contact
Greenyard Fresh NV	**www.greenyard.group**
Bakker Barendrecht	**www.bakkerbarendrecht.nl**
Nature's Pride BV	**www.naturespride.eu**
Bratzler & Co. GmbH	**www.bratzler.com/en**
Total Produce	**www.totalproduce.com**
Minor, Weir & Willis Ltd	**www.mww.co.uk**
Greencell Ltd.	**www.greencell.com**
Allan & Anderson (Importers) Ltd	**http://www.allan-anderson.co.uk**
Port International	**http://www.port-international.de/en**

6.3 Chilies – ASEAN

6.3.1 ASEAN market opportunities and insights relating to dried chilies

ASEAN is a significant market for dried chilies and has expanded substantially in recent years. Much of this growth can be attributed to Thailand's strong surge in imports of dried chilies, which is largely as an input for its fast-growing food-for-export industry – part of its 'kitchen of the world' drive. According to the *Bangkok Post*, Thailand's food exports amounted to about 1 trillion baht in 2017. Domestic consumption accounted for more than 70 per cent of the food industry, and 30 per cent related to exports. The top 10 export products were rice, processed chicken, canned and processed seafood, frozen and processed shrimps, and food seasonings. The latter includes many ready-to eat meals (e.g., Thai curries), curry pastes, sauces and condiments. The whole fruit tends to be used for dried chili, rather than powder or flakes, and the difference is increasing as the Figure below shows.

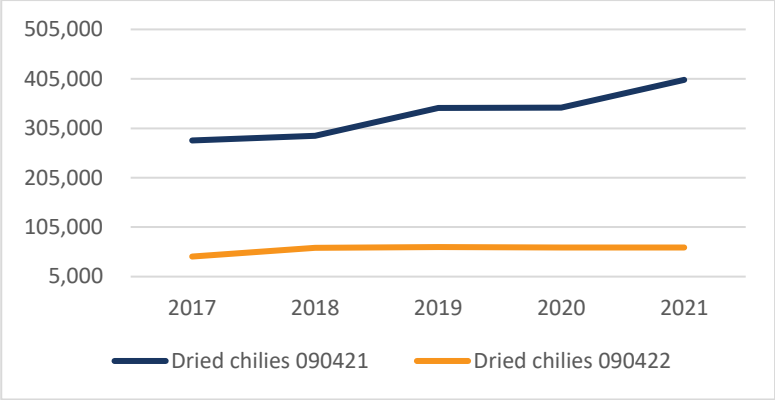
Figure 31 ASEAN imports of dried chilies (US$'000)



Source: Trade Map

* The HS codes used to arrive at a regional overview also include dried paprika in addition to dried chilies. In Asia, paprika is less important than dried chilies representing no more than 10 per cent.

Figure 32 ASEAN imports of dried chilies by type (US$'000)

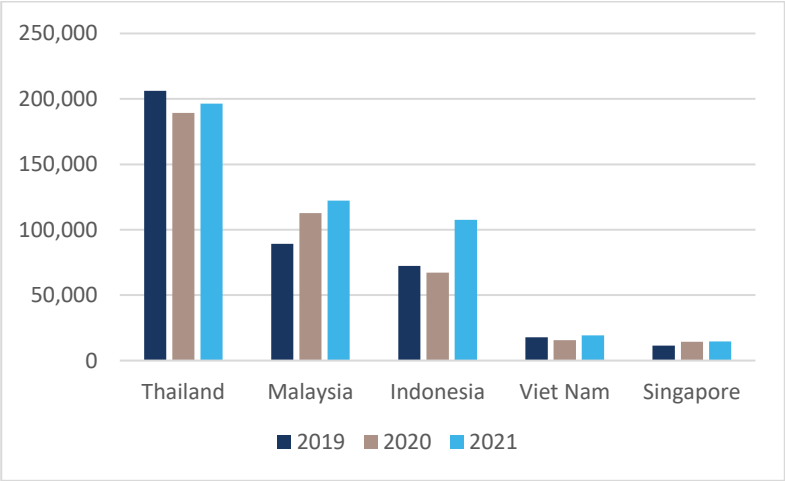


090421 Fruits of the genus *capsicum* or of the genus *pimenta*, dried, neither crushed nor ground (powder and flakes)

090422 Fruits of the genus *capsicum* or of the genus *pimenta*, crushed or ground (whole fruit)

Source: Trade Map

Figure 33 Leading importers of dried chili in ASEAN 2019-21 (US$'000))

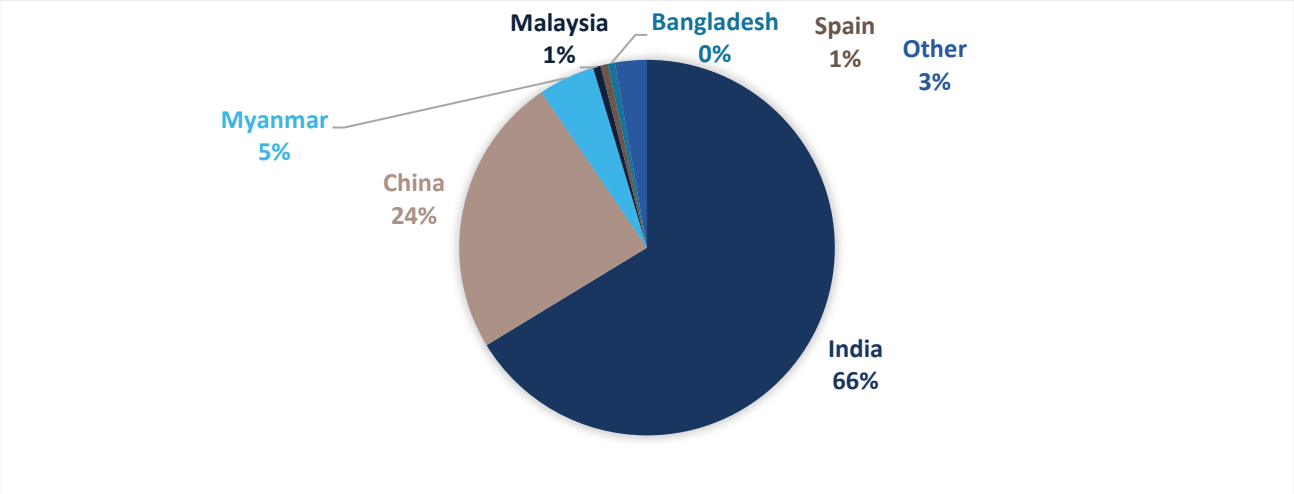


Source: Trade Map

* The codes used to arrive at a regional overview also include dried paprika. In Asia, paprika is less important than dried chili representing no more than 10 per cent.

Although the statistics from Vietnam do not include data relating to the import of chili, a look at India's (the world's leading supplier) export data – reveals that Vietnam has been importing even slightly more than Thailand, and has also been showing phenomenal growth in recent years. The dried chilies are used in the food industry to make chili and other sauces along with a series of spicy instant foods, such as instant noodles, instant vermicelli, instant porridge, instant soups, and so on. Vietnam Food Industries, Acecook Vietnam, and Nam Duong International Foodstuff Corporation are major players in this sector.

Figure 34 Leading suppliers of dried chilies to ASEAN (2021)



Source: Trade Map

Table 51 Revenue: domestic sales – sauces and ready-made meals

Location type	Revenue (US$ m)	Per capita consumption	CAGR up to 2023
THAILAND			
Ready-made meals	**782**	**3.1 kg**	**2.1%**
Sauces and condiments excl. ketchup	**278**	**2.1kg**	**0.9%**
MALAYSIA			
Ready-made meals	**63**	**0.4kg**	**2.1%**
Sauces and condiments excl. ketchup	**441**	**4.7kg**	**2.7%**
INDONESIA			
Ready-made meals	**9**	**0.008kg**	**4.1%**
Sauces and condiments excl. ketchup	**879**	**1.1kg**	**5.1%**
VIETNAM			
Ready-made meals	**2,120**	**5.9kg**	**4.4%**
Sauces and condiments excl. ketchup	**432**	**1.3kg**	**5.7%**

Source: Statista

The leading market for fresh chilies is Malaysia: imports to this country amounted to some 76,500 MT in 2021 (Trade Map). Malaysians like to home-prepare their fresh chilies with a pestle and mortar for popular dishes like Nasi Lemak.[26] According to the Malaysian Ministry of Agriculture and Agro-based Industries, quoted in an article in *Malaysiakini News*, local supply caters for only 37 per cent of Malaysian demand, 63 per cent has to be imported.[27]

Recommendation: There have been issues in recent years with pesticide residue limits (ASEAN MRL standards) being exceeded in Vietnamese imports, which is the main source of the Malaysian supply. For some time, Vietnamese chili imports were banned. This may offer opportunities for Cambodian fresh chili exports.

Table 52 Thai exports of sauces, pastes and ready-made meals (US$'000)

Sauce, paste or ready-made meals	2016	2017	2018
Other sauces (e.g., pad Thai sauce, Korean bbq. etc.)	465,263	501,362	532,847
Chili sauce	89,883	79,720	123,750
Instant curry	69,587	77,755	69,319

Source: Trade Map

Detailed data on sauces, paste and ready-made meal exports is lacking for Malaysia. However, a total figure is attainable for all of these products combined – adding up to US$167,578,000 of exports in 2021 showing a 3 per cent annual growth rate since 2017.

Table 53 Indonesian exports of sauces, pastes and ready-made meals (US$'000)

Sauce, paste or ready-made meals	2020	2021
Chili sauce	**15,035**	**13,703**

Source: Trade Map

Prospective Importers

- Thai President Foods
- CP Charoen Pokphand Foods
- Exotic Food Thailand
- Nestlé (Malaysia) Bhd.
- Dewin Fiid Industries Sdn Bhd
- Indofood
- Sekar Group
- Wings Group

[26] **http://www.bbc.com/travel/story/20191111-where-is-malaysias-national-dish**

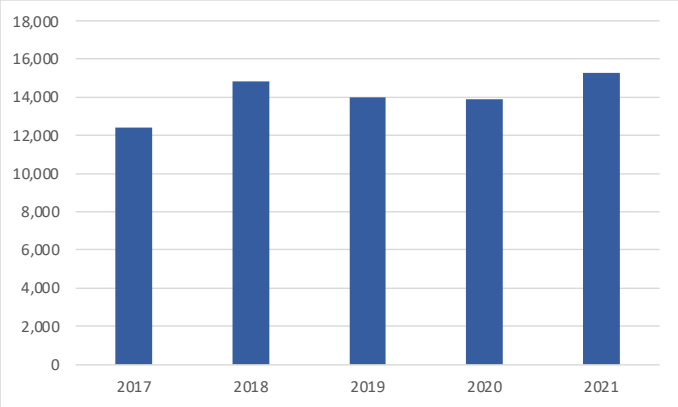
[27] **https://www.malaysiakini.com/news/440335**

6.4 Chilies - Japan

6.4.1 Japanese market opportunities and insights for dried chilies

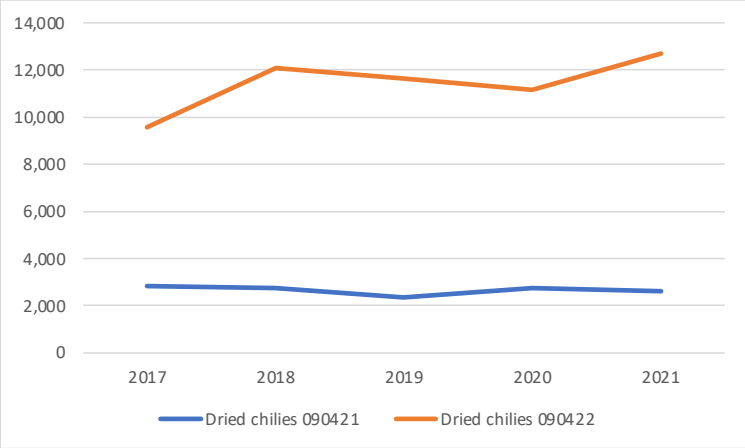
Interestingly, Japanese consumers differ considerably from their Korean and Chinese neighbours in that they do not take to very hot spicy cuisine. Consequently, Japan is a small market for dried chilies importing some 15,000MT. This trade category also includes paprika powder. Most of the imports are in the flakes and powder form, with only some 2,000 MT in whole fruit form. The lion's share of both whole fruit and flakes and powder comes from China, a mega supplier of dried chilies globally. Spain and South Korea are the only other suppliers of significance, mainly in value terms as their supply is to a larger extent in the form of branded packed products for direct retail sale. The price information below also reflects this.

Figure 35 Japanese imports of dried chilies (MT)



Source: Trade Map

Figure 36 Japanese imports of dried chilies by type (MT)

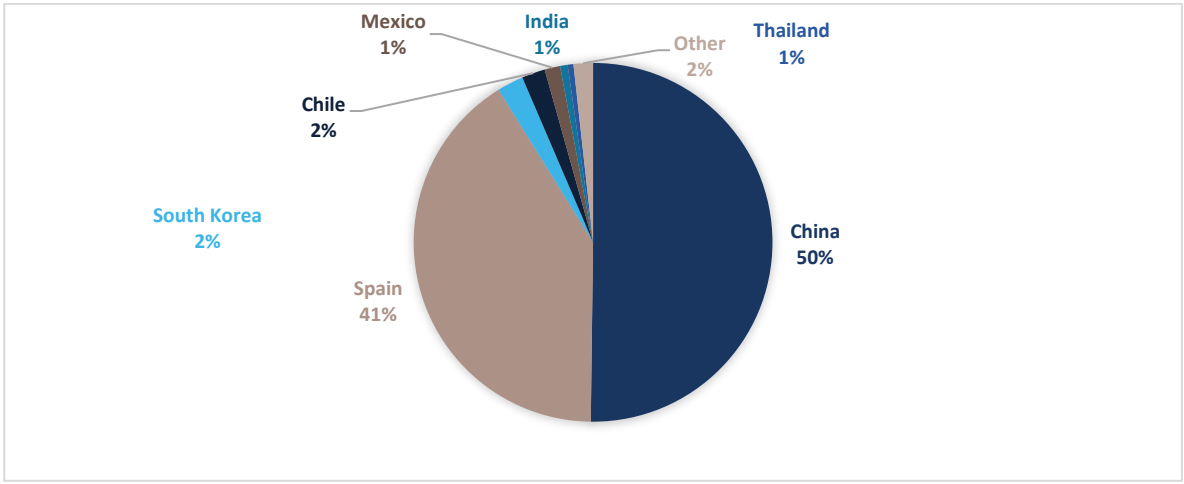


090421 Fruits of the genus *capsicum* or of the genus *pimenta*, dried, neither crushed nor ground – whole fruit

090422 Fruits of the genus *capsicum* or of the genus *pimenta*, crushed or ground – flakes and powder

Source: Trade Map

Figure 37 Japanese imports of dried chilies –supply sources (US$ million) (2021)



Source: Trade Map

While chili is not often considered a standard Japanese spice, it is used in a number of popular Japanese foods, sauces, and seasonings. For example, the spicy La-Yu oil is infused with chili peppers and often includes grated or dried chili. The manufacturer and brand-owner S&B Foods is a very large player in the market and at one point accounted for 40 per cent of Japan's spices and herbs market.

Shichimi togarashi, or Japanese seven-spice blend, contains three of the spices on our list along with several other ingredients. As the name suggests, seven spices or flavourings are combined to create a unique blend. These can include:

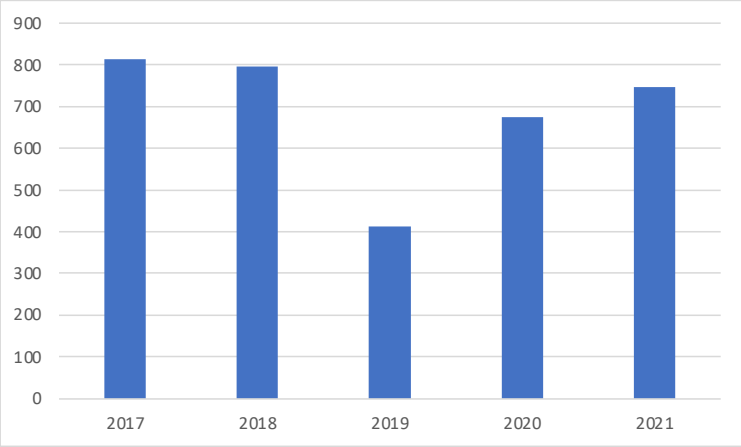
- Chili pepper
- Sansho pepper
- Orange peel
- Sesame seeds (black / white)
- Hemp seeds
- Poppy seed
- Ginger
- Dried seaweed

Shichimi togarashi originally became popular during the Edo period in Japan, and is now often considered a table spice that can be added to a range of dishes according to personal preference. However, it can also be included during the cooking stage.

6.4.2 Japanese market opportunities and insights for fresh chilies

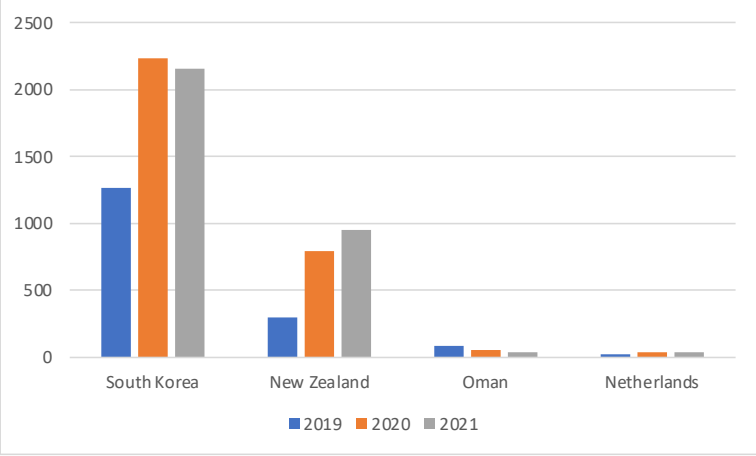
As indicated in the graph below, Japan imports some 800 tons of fresh chilies annually. This trade category does not include paprika, i.e., it is uniquely chilies. The 'fresh' category is primarily destined for direct retail and the horeca (hotels, restaurants and catering) segment. Supply appears to have been disrupted considerably in relation to the COVID pandemic, but towards 2021 imports were climbing back up again. In contrast to dried chili imports, fresh chilies are not sourced from China, but primarily from South Korea and New Zealand. Kenya, a new entrant to the market, has recently managed its first shipment and has successfully navigated the post-approval process.

Figure 38 Japanese imports of fresh chilies (MT)



Source: Trade Map

Figure 39 Japanese imports of fresh chilies – main supply sources (US$'000)



Source: Trade Map

With an inclination to go for less spicy dishes, the Japanese consumer prefers the milder chilies. A famous Japanese mild chili, Shishito, is commonly blistered in olive oil and served with a sprinkle of sea salt.

6.4.3 Price and Tariff advantages

Table 54 Average Japanese CIF import prices: Dried – flakes and powder (in bulk)

	CIF, US$/Kg	CIF, US$/Kg	CIF, US$/Kg
China	3.58	3.8	3.92
Spain	4.29	4.29	4.5
South Korea	7.46	6.66	7.17
Chile	16.00	17.00	13.00
United States	8.84	7.38	7.10
Peru	3.37	3.46	3.58
India	3.15	3.14	3.59

*including paprika powder

Source: Trade Map

Table 55 Average Japanese CIF import prices: Dried – flakes and powder (put in containers for retail sale)

	CIF, US$/Kg	CIF, US$/Kg	CIF, US$/Kg
China	4.56	4.57	4.44
South Korea	5.32	8.84	9.06
India	2.96	3.5	3.93
Turkey	6.25	3.03	2.27
Spain	12	15	16

*including paprika powder

Source: Trade Map

Table 56 Average Japanese CIF import prices: Dried – whole fruit (bulk)

	CIF, US$/Kg	CIF, US$/Kg	CIF, US$/Kg
China	5.51	5.83	6.17
Mexico	3.04	3.59	4.14
Jamaica	7.09	11	11
Vietnam	14	14	14
Guatemala	3.11	3.27	3.01

Source: Trade Map

Table 57 Average Japanese CIF import prices: Fresh chilies

	CIF, US$/Kg	CIF, US$/Kg	CIF, US$/Kg
South Korea	4.12	4.95	4.21
New Zealand	3.28	3.73	4.31
Oman	8.76	9.02	4.62
Netherlands	7.61	8.09	7.99
Kenya			4.69

Source: Trade Map

In terms of tariff advantage, Japan's market is very open for this product. Thus, Cambodia could gain an advantage of no more than 1.5 per cent to 2 per cent for dried chili and 3 per cent for fresh.

6.4.4 Trade Fairs

- FOODEX Japan 2023, March 7-10, 2023, Tokyo Big Sight, Tokyo
- FABEX Kansai 2022, September 7-9 2022, Intex Osaka, Osaka
- FABEX Kansai is for the food market in Kansai area and west of Japan
- Supermarket Trade Show 2023, February 15-17, 2023, Makuhari Messe, Chiba

6.4.5 Importers

Company	Website
Kaneka Sun Spice	**https://www.kanekasunspice.co.jp/english/**
S&B Foods	**https://www.sbfoods-worldwide.com/discover/procurement.html**
All Nippon Spice Association **Member List**	**http://www.ansa-spice.com/M02_CompanyList/CompanyList.html**

7 Sweet Potato

7.1 Product Definition

The sweet potato (*Ipomoea batatas*) is a root vegetable. Despite its name, the sweet potato does not belong to the same family as the common potato (*Solanum tuberosum*). Sweet potatoes vary in the colour of their skin and flesh, and in their shape.

In Southeast Asia, common sweet potatoes include a rounder, larger variety, with orange flesh and a pale skin, or a deep purple flesh as well as skin, which is more elongated in shape (known as the Stokes Purple variety). Japanese sweet potatoes are highly prized for their purple skin with yellow flesh, and these are now also being produced in Vietnam.

The orange flesh varieties are most common in Europe and there are two varieties that cover 95 per cent of the market:

- The American Covington
- The Spanish Beauregard

Sweet potatoes have in recent years grown in popularity as a tasty, colourful food with many health benefits: they are an excellent source of beta carotene, vitamin C, and potassium.

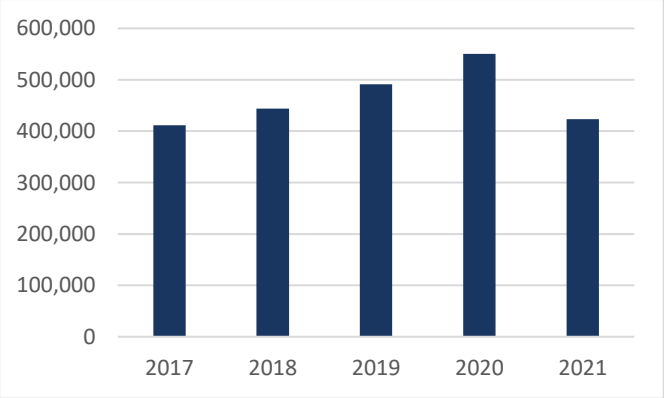
Table 58 Trade data classification

Market	Code	Label
	071420	Sweet potatoes, fresh, chilled, frozen or dried, whether or not sliced or in the form of pellets
EU		Whole sweet potatoes – fresh or chilled
	07142090	Sweet potato – sliced fresh/frozen or dried pellets
Thailand	07142010	Sweet potatoes, fresh, chilled, frozen or dried, whether or not sliced or in the form of pellets: frozen
	07142090	Sweet potatoes, fresh, chilled, frozen or dried, whether or not sliced or in the form of pellets: other
Singapore	07142010	Sweet potatoes fresh chilled or dried
	07142090	Sweet potatoes frozen

7.2 Sweet Potato – Europe

7.2.1 European market opportunities and insights for sweet potato

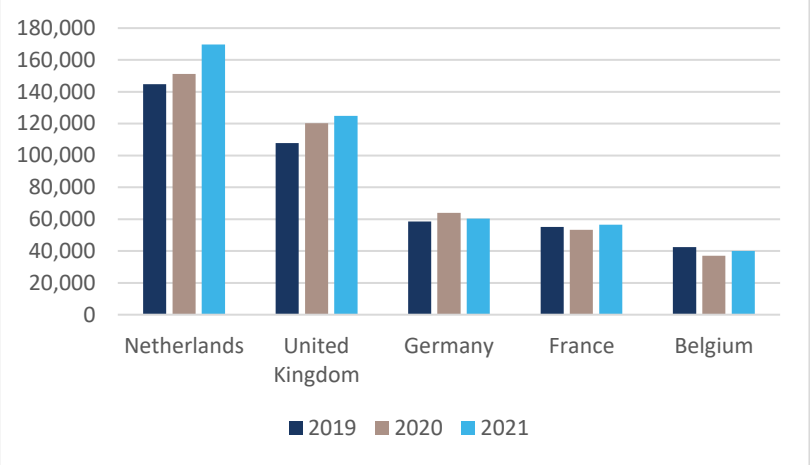
Figure 40 European (EU + UK) imports of sweet potato, 2017–21 (tons)



Source: Trade Map

Imports of sweet potato from within Europe (mainly Spain) and abroad have experienced a strong surge in recent years, more than doubling between 2014 and 2018 and continuing to climb up until 2020. Europe has become the world's largest market, with 68 per cent of global imports. The growing appetite of European consumers for sweet potatoes is, in part, thanks to promotional efforts, spearheaded by the American Sweet Potato Marketing Institute (ASPMI) and the North Carolina Sweet Potato Commission. The United States is Europe's largest supplier with a 33 per cent market share.

Figure 5 Leading importers of sweet potato in Europe (EU + UK) (US$'000)



Source: Trade Map

The UK is the largest market for sweet potatoes, where the popularity of ethnic food and healthy nutrition have contributed to their popularity. In fact, they have become so popular in the UK that there is now a British-grown variety. This might explain the levelling-off of growth in respect of imports, but more likely it has simply reached its peak. Sweet potatoes have become a regular product on the shelves of British supermarkets.

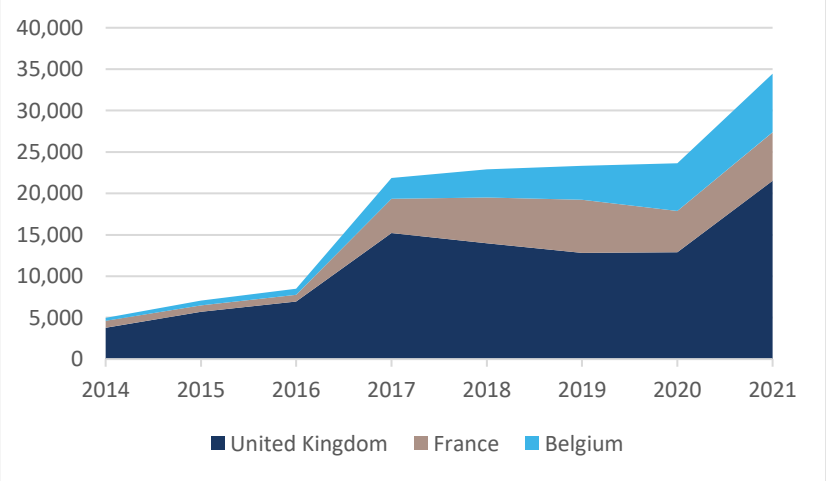
Germany is also a key market in Europe. The Netherlands, offering an established trade route into Europe, re-exports around three quarters of its imports, mostly to Germany: a large quantity of the sweet potatoes entering mainland Europe are traded through the Netherlands, and, from here, it is distributed to places such as Germany, France and Scandinavia.

www.mccain.co.uk

France, the Netherlands and Belgium show especially high growth. German consumers have responded positively to effective marketing campaigns to promote American sweet potatoes. A promotional 'Street Food Truck Tour' for several months over consecutive years stopped at a number of German retailers and large-scale outdoor events to promote sweet potato dishes. Consumers were able to taste the product in their popular forms of fries and in creative dishes such as savoury-sweet potato waffles and skewers.

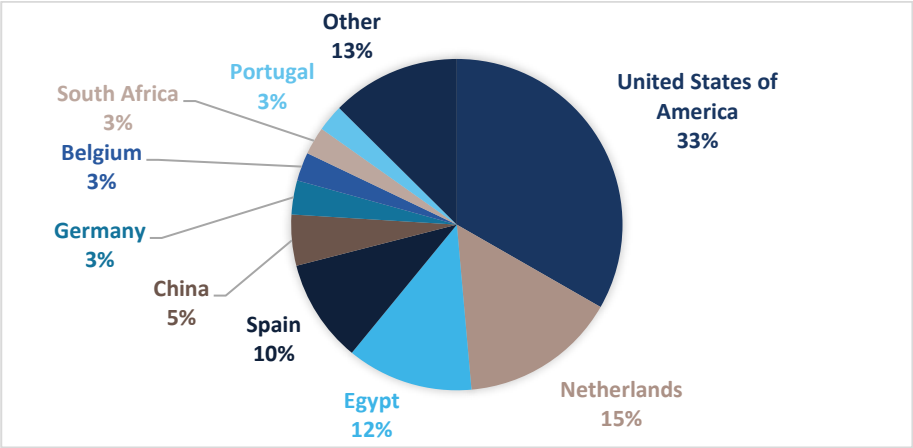
In the UK, sweet potato French fries have taken off thanks to a surge in awareness of a healthier, tastier and more colourful alternative to regular potato French fries. France and Belgium have shown similar growth in imports of sweet potato fries.

Figure 42 Fast growing importers of sweet potato French fries (US$'000)



Source: Trade Map

Figure 6 Leading sweet potato suppliers to the European market (EU+UK) (% value) in 2021



Source: Trade Map

Some more noteworthy characteristics and trends on the European market for sweet potatoes:

- For European consumers, taste is of growing importance. The taste of sweet potatoes stands out from that of other tubers and potatoes and this can be a unique selling point to attract the consumer.
- Consumers in Europe are becoming more aware of health issues and pay more attention to their diet. This is a boon for the marketing of sweet potatoes that are rich in vitamins A and C and are considered to be a healthier alternative to regular potatoes.
- There is also a growing interest in organically produced sweet potatoes. Organic supply is increasing, but does not meet demand, offering opportunities. Suppliers with certifications that are in line with the GSCP will have a better chance of being accepted by European supermarkets.[28]

7.2.2 Standards

Minimum standards

For sweet potatoes there are no official quality requirements. Therefore, the minimum requirements of the General Marketing Standards of Regulation (EU) 543/2011 apply.

The general marketing standards state that products shall be:

- intact and sound
- clean, practically free from any visible foreign matter
- practically free from pests
- practically free from damage caused by pests affecting the flesh
- free from abnormal external moisture
- free from any foreign smell and/or taste.

The condition of the products must be such as to enable them:

- to withstand transport and handling
- to arrive in a satisfactory condition at the place of destination.

The United States standard for grades of sweet potato can serve as a useful reference.[29] Conformity checks are part of European Regulation (EC) No. 1580/2007. In the event that your product does not meet the standard, it can be rejected. In certain third countries local inspection bodies are allowed to carry out pre-export checks.

28 https://www.oecd.org/daf/inv/mne/45634152.pdf

29 https://www.ams.usda.gov/sites/default/files/media/Sweetpotato_Standard%5B1%5D.pdf

Private standards

This study covers the separate legal requirements for each of the markets being studied in Annex 1. These include hygiene and first-level food safety management – HACCP.

Common requirements

Food safety is a primary concern and, as such, most buyers, whose aim is to reassure their customers, will very likely request additional guarantees that legal requirements have been met in the form of certification. The most commonly requested certification for sweet potatoes is GLOBALGAP, which covers practices at the pre-farm-gate level. As this is crucial for most supermarket chains it is unavoidable, even though it is not a legal requirement for entering the market. However, the insistence on GLOBALGAP certification depends on the location within Europe: in Southern and Eastern Europe it is less of an absolute priority.

Recommendation: A major priority for Cambodian sweet potato producers is the more speedy adoption of GAP. Note: While this is pending, the Vietnamese sweet potato sector is surging ahead with VietGAP certification.

Food safety management systems (post-farm-gate), frequently requested and well recognised, that go beyond simply adherence to HACCP principles, include IFC, BRC, SQF and FSSC22000.

Niche requirements

Requirements for niche customers include certifications such as 'organic'. The market for organic sweet potatoes is relatively small, but demand is growing, and the supply is limited. Note, however, that in order to market organic products in Europe, organic production methods – that are in accordance with European legislation – must be employed, and an 'organic' certificate must be acquired from an accredited certifier.

Implementing GRASP provides good basic social certification: GRASP is part of GLOBALGAP and is gaining in importance.[30]

Another good option is the implementation of standards recognised by SIFAV: this is an initiative for traders and retailers who were determined to become 100 per cent sustainable in sourcing from Latin America, Africa and Asia by 2020.[31]

A few specialised buyers provide extra opportunities for socially certified products. These include certification schemes such as Fair for Life or Fairtrade. In general, however, Fairtrade certification is losing its importance in Europe.

7.2.3 Tariff advantages and prices for sweet potato

Table 59 Tariff advantages

Code	Tariff	Regime	Exporting Country
714201000 (whole)	**3%**	**MFN**	**United States, China**
0714209000 (fries)	**6.4 EUR/100 kg**	**MFN**	**United States, China**
714201000 (whole)	**0%**	**EBA**	**Cambodia**
714201000 (whole)	**0%**	**EU-Egypt FTA**	**Egypt**
714201000 (whole)	**0%**	**EU-Central America FTA**	**Honduras**

Source: Market Access Map

30 **https://www.globalgap.org/uk_en/for-producers/globalg.a.p.-add-on/grasp/index.html**

31 **https://www.idhsustainabletrade.com/resource/sifav-basket-standards/**

Table 60 UK fresh, sweet potato average CIF prices (USD/kg whole, fresh)

	2019	2020	2021
United States	0.75	0.76	0.75
Egypt	0.87	0.68	0.70
China	0.59	0.57	0.65
Netherlands	1.36	0.83	0.96
South Africa	0.94	0.81	0.94

Source: Trade Map

6.2.4. European trade fairs and prospective buyers for sweet potatoes

- Fresh
- Fruit Logistica
- Biofach
- ANUGA
- SIAL

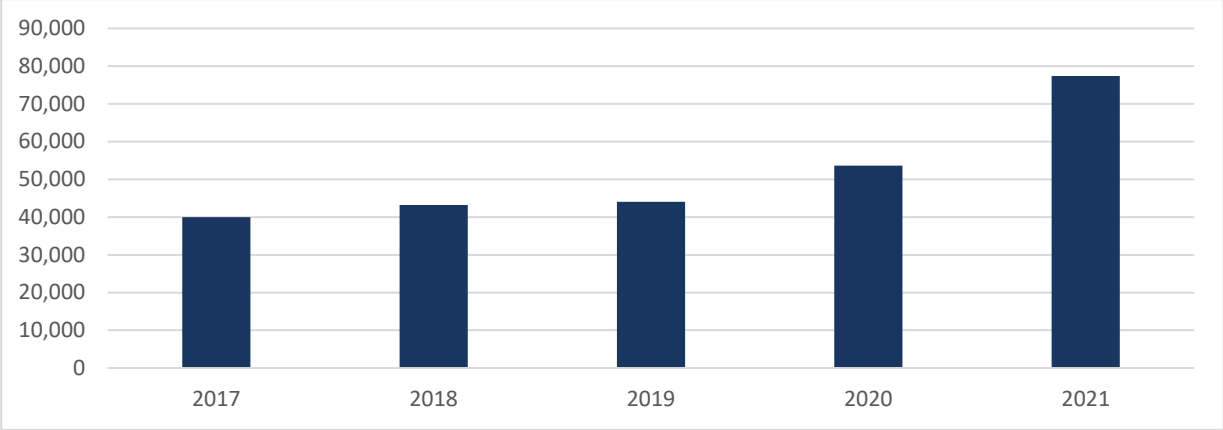
Table 61 Prospective buyers

Company	Website	Product
Bakker Barendrecht	**www.bakkerbarendrecht.nl**	**avocado**
Nature's Pride BV	**www.naturespride.eu**	**avocado, mango, sweet potatoes**
Bratzler & Co. GmbH	**www.bratzler.com/en**	**avocado**
Minor, Weir & Willis Ltd	**www.mww.co.uk**	**sweet potatoes, mango**
Greencell Ltd.	**www.greencell.com**	**avocado**
Port International	**http://www.port-international.de/en**	**sweet potatoes, avocado**
JMF	**https://www.jmfpartenariat.com**	**avocado**
BR Fresh Exotics BV	**http://www.brfreshexotics.com**	**sweet potato, avocado**
Beva Fruits	**http://bevafruits.com**	**avocado**

7.3 Sweet Potato – ASEAN

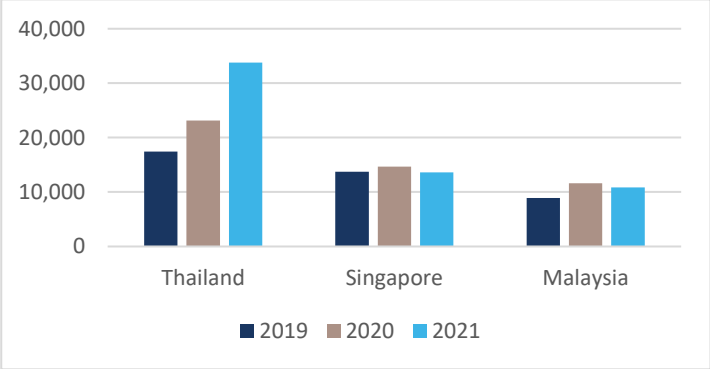
7.3.1 ASEAN market opportunities and insights for sweet potato

Figure 44 ASEAN imports of sweet potato, 2017–21 (tons)



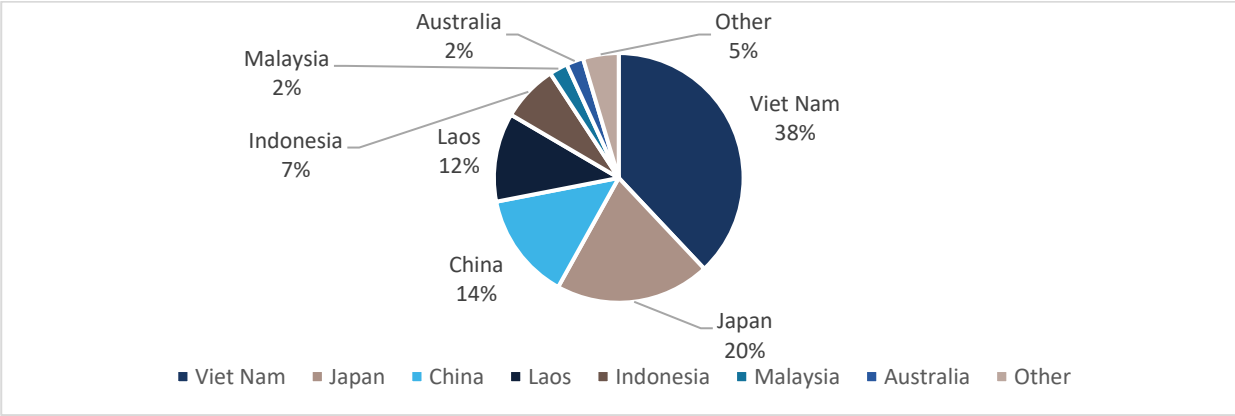
Source: Trade Map
Imports to Laos have been removed due to an obvious data error

Figure 45 Leading ASEAN importers of sweet potato (US$'000)



Source: Trade Map

Figure 46 Leading sweet potato suppliers to the ASEAN market (% value) in 2021



Source: Trade Map

The ASEAN market for sweet potato is smaller than that of Europe, but is still adequately significant, reaching close to 80,000 MT. Thailand, the largest market, should be self-sufficient, but is not. Several agronomists and economists have tried to identify an explanation. Part of it relates to the fact that the Japanese type of sweet potato is much sought after and considered 'premium' in Thailand as well as in Singapore and Malaysia. Vietnam is now producing this variety, so imports currently come from both Japan and Vietnam.

Vietnam also supplies other varieties that are more common in Southeast Asia (as described in the product definition section above). This has mainly come about thanks to partnerships among large supermarket chains. MM Mega Market wholesaler and Big C Supermarket/Hypermarket chain in Thailand share a common parent: TCC Group. (As of 2019, Big C was operating 153 hypermarkets, 63 Big C markets, and 1,018 Mini Big C stores.)

MM Mega Market facilitated its suppliers to gear up to supply Big C with dragon fruit and sweet potatoes (both yellow and purple). In the first year, 45 MT of sweet potatoes were supplied to Big C. The Vietnamese sweet potato suppliers from Lam Dong and Binh Thuan have been described as reliable, and offer high quality and safety standards (*The Nation*, Thailand).

Vietnamese success in becoming a leading supplier of sweet potato in Singapore owes its origins to a similar partnership. MM Mega Market Vietnam will export fresh produce to Singapore through CMM Singapore for distribution to the 60 Sheng Siong Supermarket stores. Sheng Siong Supermarket is the third-largest retailer in Singapore (Vietnam Investment Review).

Sweet potato flour is widely used in processed food products such as baked goods (bread, cookies, muffins, pancakes and crêpes) and as a thickening agent for sauces and gravies. In recent times, the purple kind of sweet potato flour has become a particularly important ingredient in many types of snacks, such as the purple coloured 'healthy crackers'. A scientific paper quotes: 'Purple sweet potato snacks prepared from 50 per cent pre-gelatinized flour had a good appearance, light texture, high anthocyanins and high antioxidant activity. Results showed that Thai purple sweet potato flours can be used to produce healthy snacks with improved appearance and texture. They also have potential as sources of natural colourants and antioxidants in food products…..'.

In fact, the real value of sweet potatoes is not in the potato itself but rather belongs to the marketing hype that can be created around the deep purple colour. China supplies purple sweet potato concentrate – applied in all sorts of fancy purple items including desserts, drinks, cakes and cookies – that can add a striking colour and create a social media frenzy. The juice concentrate strikes a perfect balance in terms of colour and sensory appeal, as well as meeting clean label[32] requirements.

[32] **Clean Label is a recently popular phenomenon that many processed food companies have been increasingly expected to follow – making a product using as few ingredients as possible, and making sure those ingredients are items that consumers recognise and think of as 'wholesome', and that they might use at home.**

Examples of suppliers include CNJ Nature and EPC Natural Products:

Sources: Pinterest, womenshealthmag.com, aubonpain.com

Another version of sweet potato takes the form of frozen fries, which are also slowly gaining in popularity – a tastier and healthier alternative to traditional French fries made from regular potatoes. From Thailand's import statistics it is evident that the Thai market has also started to import several hundred tons of frozen sweet potato fries from Vietnam and Indonesia. CIF prices show significant value increases of close to 100 per cent. Singapore also imports a small quantity of frozen sweet potato fries, mainly from the United States.

7.3.2 Standards

An ASEAN standard has been developed for sweet potatoes.[33]

7.3.3 Prices and comparative tariff advantages

Table 62 Average Thai CIF import prices – sweet potato

Country of origin	2019	2020	2021
Thailand Fresh Sweet Potato Average CIF Prices US$/kg			
Vietnam	**1.17**	**1.14**	**1.11**
Japan	**6.19**	**4.51**	**4.34**
Singapore Fresh Sweet Potato Average CIF Prices US$/kg			
Vietnam	**1.15**	**1.13**	**1.17**
Japan	**4.28**	**4.16**	**4.54**

Source: Trade Map Database

Table 63 Comparative tariffs applied by Thailand and Singapore to imports of sweet potato

Singapore (no quota)			
07142090 (fresh)	**0%**	**MFN**	**Unites States, Cambodia, Vietnam, Laos, Indonesia, Japan**
7142010 (frozen)	**0%**	**MFN**	**Unites States, Cambodia, Vietnam, Laos, Indonesia, Japan**
Thailand (no quota)			
07142090 (fresh)	**40%**	**MFN**	**United States**
07142090 (fresh)	**0%**	**ASEAN**	**Cambodia, Vietnam, Laos, Indonesia**

[33] **The full document can be downloaded at: https://asean.org/storage/2012/05/38-ASEAN-standard-for-sweet-potato_clean-text.pdf**

07142090 (fresh)	0%	ASEAN-Japan FTA	Japan
7142010 (frozen)	30%	MFN	United States
7142010 (frozen)	0%	ASEAN	Cambodia, Vietnam, Laos, Indonesia
7142010 (frozen)	0%	ASEAN-Japan FTA	Japan

Source: Market Access Map

6.2.5. Trade Fairs

- Thaifex
- Horti Asia
- SIMA ASEAN Thailand
- FI Food Ingredients Asia

8 Avocado

8.1 Product definition

Avocados are a buttery fruit that has become very popular throughout the world. Prized for being healthy and nutritious, they contain more potassium than bananas, are loaded with heart-healthy monounsaturated fatty acids, and are full of fibre. Avocadoes are best known as the basic ingredient for guacamole – an avocado-based sauce which originated from Mexico – and are used as a dip or condiment. Additionally, they are used in salads, on sandwiches and spreads, and increasingly in healthy smoothies.

Beyond its popularity as a food product, the fruit is also being adopted into skin care and the cosmetics sector.

Although there are many commercial varieties of avocado, the Hass variety, named after the horticulturalist Rudolf Hass, is the most traded internationally because of its taste, size, shelf-life, high growing yield and, in some areas, year-round harvesting. The Hass cultivar is the most commercially popular avocado worldwide, and this variety accounts for 80 per cent of avocados world-wide, easily beating other main varieties like Fuertes, Pinkertons and Zutanos. Hass trees grow vigorously, are easy to propagate and produce an impressive amount of fruit by only the second or third year. They have a longer harvest season than other avocado varieties and, most importantly, the thicker skin of the Hass gives it an edge over other varieties when it comes to handling the fruit and shipping it over long distances. In the United States, Hass avocados account for 80 per cent of the avocado crop. It is the most widely grown in New Zealand, too, and also constitutes the majority of imports into Europe. China imports only Hass. **Cambodian commercial nurseries and farmers have also caught on to its long shelf-life compared with other varieties and have started to cultivate Hass.**

The Hass avocado is a small-sized fruit. When ripe, the skin becomes a dark, purplish-black and yields to gentle pressure. When ready to serve, it becomes white-green in the middle part of the inner fruit.

FruiTrop provides a detailed description of all commercial varieties.[34]

34 https://www.fruitrop.com/en/Articles-by-subject/Varieties/2014/Main-commercial-varieties-of-Avocado

Table 64 Trade data classification

Code	Label	Side note
080440	**Fresh or dried avocados**	**All markets covered in this study do not apply any further classification**

8.2 Avocado – Europe

8.2.1 European market opportunities and insights for fresh avocados

Based on production and trade statistics, the total annual European consumption of avocados is approaching 500,000 tonnes, which is around one kilo *per capita*. This consumption rate is still relatively low compared with the United States, for example, where people consume four times as many avocados. Nevertheless, avocados are rapidly gaining in popularity. European avocado enthusiasm is reflected in the phenomenal growth of imports as can be seen in the Table below. It is the third most popular imported fruit, in 2021 reaching a staggering, overall total of US$3.5 billion. Dynamic demand for the fruit is also evident across the entire EU, with virtually every market showing growth in imports over the last five years, many of them double-digit. According to the Agricultural Outlook 2021-2030 report from the Organization for Economic Cooperation and Development (OECD) and the Food and Agriculture Organization of the United Nations (FAO), avocado is expected to become the second-most traded major tropical fruit by 2030, after bananas.

France and Germany are the largest markets in Europe followed by Spain and the United Kingdom. The Netherlands plays a vital role as a trading hub for the rest of Europe, mostly to Germany, France and Scandinavia. That country is also responsible for one third of Europe's avocado imports.

According to CBI, Netherlands, continued growth is expected, but, at the same time, the market will remain competitive and importers are said to favour large suppliers because they can guarantee more certainty of supply.

Peru has emerged as another mega supplier accounting for 25 per cent of the EU's imports. If intra-EU re-exports are excluded, Peru's share of the market is significantly higher. Chile, South Africa, Mexico, Spain, Israel and Kenya are also key players in the market. Spain is the most important producer of avocados in Europe, but Spanish traders also increasingly purchase avocados from abroad to complement their own season and to comply with international supply contracts.

The suppliers' windows in the market vary relating to their seasons – as can be seen in the supply calendar below. In order to convey Cambodia's prospects, the assumption is made that Thailand's Hass avocado season and time-to-market window would be similar to those of Cambodia.

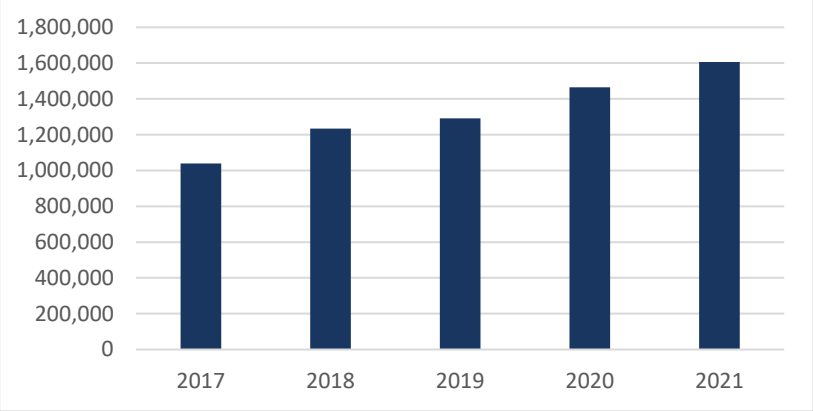
Table 65 Top 25 European fruit imports

	US$ million 2021	CAGR 2017-21
Fresh or dried bananas	6,733.3	0.6%
Fresh grapes	3,926.6	4.1%
Fresh or dried avocados	3,503.7	11.3%
Fresh or dried oranges	2,597.6	0.6%
Fresh apples	2,435.0	-1.1%
Fresh cranberries, bilberries	2,402.5	19.4%
Fresh or dried lemons and limes	2,008.1	2.2%
Fresh kiwifruit	1,900.8	9.0%
Frozen fruit	1,687.3	7.6%
Fresh strawberries	1,665.7	6.2%
Fresh raspberries, blackberries, mulberries and loganberries	1,657.3	14.2%
Fresh peaches, incl. nectarines	1,519.3	1.7%

Fresh or dried guavas, mangoes and mangosteens	1,477.4	8.0%
Fresh or dried clementines	1,396.4	2.7%
Frozen raspberries, blackberries, mulberries, loganberries	1,184.5	13.6%
Fresh watermelons	1,171.8	8.4%
Fresh pears	1,165.1	0.9%
Fresh or dried mandarins	1,128.3	11.2%
Fresh or dried pineapples	1,072.6	-2.4%
Fresh tamarinds, cashew apples, jackfruit, lychees, passion fruit, etc.	962.1	4.9%
Fresh melons	958.7	-1.7%
Dried grapes	749.9	0.3%
Frozen strawberries	622.6	4.0%
Fresh cherries	614.0	5.7%

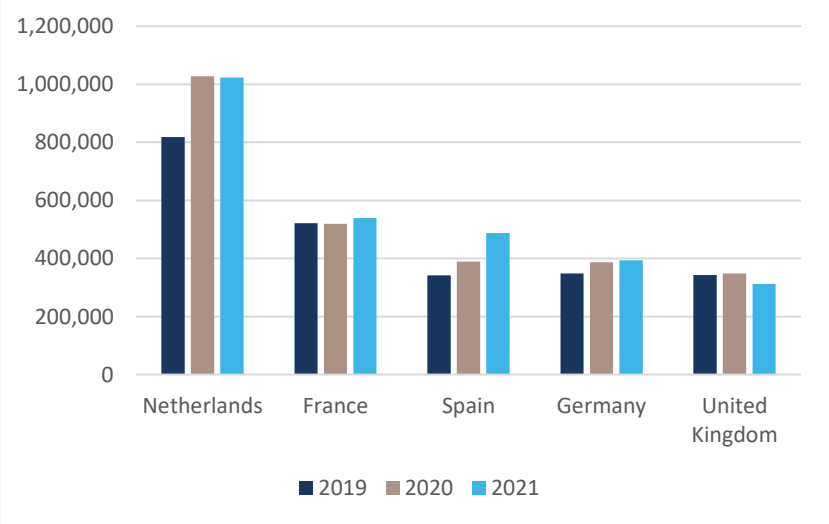
Source: Trade Map

Figure 7 European (EU+UK) imports of avocado, 2017–21 (tons)



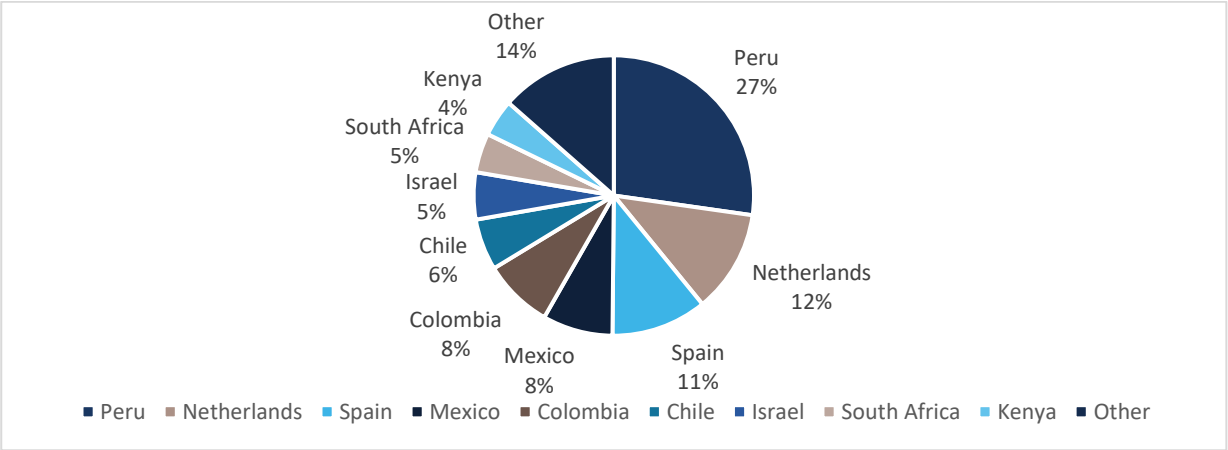
Source: Trade Map

Figure 48 Leading European (EU+UK) imports of avocado (US$'000)



Source: Trade Map

Figure 49 Leading suppliers of avocado to Europe EU+UK, 2021 (US$ m)



Source: Trade Map

Worth mentioning is the fact that there is a distinct lack of Asian presence in the list of suppliers: China stands alone at 61st on the list.

Table 66 Europe's supply calendar and Thailand's Hass supply window (indicated by the dark blue border) as a comparable reference for Cambodia

	J	F	M	A	M	J	J	A	S	O	N	D
Peru												
Chile												
S. Africa												
Israel												
Mexico												
Kenya												
Colombia												
Morocco												
Spain												

Source: CBI and other internet sources.

* The Thai window takes into consideration the harvest period for Hass and estimated time to market.

Currently the European market is flooded by Peruvian avocados. This does, however, not pose a threat to Cambodia, assuming that the Cambodian Hass season and time-to-market will match those of Thailand. Cambodian avocados would reach the market at the same time as those from Israel and Chile, and partially overlap Kenya and Colombia.

Some more key insights on the European market:

Ready-to-eat. The global avocado industry has realised that consumers, especially those in Europe, frequently shop for ingredients required for a meal that same day or perhaps the following day, but no later. If the avocado on the shelves is unripe, and it is uncertain when it will be ready to eat, the consumer will generally opt not to buy. Ripeness, therefore, has a strong influence on sales. It is, nevertheless, still quite difficult to maintain a continuous stock of ripe avocados since they become over-ripe quite rapidly. And international shipping still needs to be conducted during the unripe stage. Artificial ripening by importers/wholesalers has now become a trend, and not only are consumers buying more, they are prepared to pay a premium price for high quality, ready-to-eat avocados. The added value of taste and ripening fruit is setting a new standard.

Frozen. European consumers like the convenience of accessing avocados to consume at any time, particularly for making healthy smoothies – i.e., frozen. Demand for frozen avocado halves is on the rise.

Healthy eating. European consumers are becoming more aware of health issues and are paying more attention to their diet. Avocado responds to this trend thanks to its good fats, fibre, vitamins and minerals.

Sustainability. Environmental and social issues are becoming increasingly important in the supply of fresh fruit and vegetables. This is also the case for avocados, for example, in water usage during production. Certification schemes that are in line with the GSCP will have a higher chance of being accepted by European supermarkets.

Organic. There is a growing niche in Europe for organic avocados, and demand is still greater than international supply can meet, offering good opportunities.

8.2.2 Standards

Marketing – quality, sizing, packaging and labelling

The marketing standards for avocados in Europe are not EU legal directives as they are for kiwis or apples. However, the entire industry adheres to the standards formulated by the *Codex Alimentarius* and UNECE for avocados. The standard specifies various classes of avocado, but, in all cases, a minimum requirement applies. The avocados must:

- be whole
- be sound – produce affected by rotting or deterioration such as to make it unfit for consumption is excluded
- be clean, practically free from any visible foreign matter
- be practically free from pests and damage caused by them affecting the general appearance of the produce
- be free from abnormal external moisture, excluding condensation following removal from cold storage
- be free from any foreign smell and/or taste
- be practically free from damage caused by low and/or high temperatures
- have a stalk not more than 10 mm in length which must be cut off cleanly. (However, its absence is not considered a defect on condition that the place of the stalk attachment is dry and whole.)

The avocados must have reached a stage of physiological development that will ensure the completion of the ripening process, in accordance with criteria appropriate to the variety and to the area in which they are grown. The mature fruit should be free of bitterness.

The development and condition of the avocados must be such as to enable them to:

- withstand transport and handling
- arrive in a satisfactory condition at the place of destination.

In terms of maturity, the fruit should have a minimum dry matter content at harvest, according to the variety, to be measured by drying to constant weight:

- 21 per cent for the Hass variety
- 20 per cent for the varieties of Torres, Fuerte, Pinkerton, Edranol and Reed.

Fresh avocados are classified according to Size Codes 1 to 30, with a minimum weight of 123 grams (or for Hass, 80 grams). In Europe, the preferred sizes for Hass avocados range between 16 and 20.[35]

Buyer requirements and standards

This study covers separate legal requirements for each of the markets in Annex 1. This includes hygiene and first-level food safety management – HACCP.

35 **For further details on classes, sizes, packaging and labelling refer to: *Codex Alimentarius* Standard for avocados (CODEX STAN 179-1995)- http://www.fao.org/input/download/standards/321/CXS_197e.pdf**

Common requirements

Food safety is a primary concern and, as such, most buyers, who need to reassure their customers, are likely to request guarantees that are additional to legal requirements, in the form of certification. The most commonly requested certification requested for avocados is GLOBALGAP, which covers practices at the pre-farm-gate level. As this is crucial for most supermarket chains it is unavoidable, even though it is not a legal requirement for entering the market. However, insistence on GLOBALGAP certification depends on the location within Europe: in Southern and Eastern Europe it is less of an absolute priority.

Food safety management systems (post-farm-gate), frequently requested and well recognised, that go beyond simply adhering to HACCP principles, include IFC, BRC, SQF and FSSC22000.

Niche requirements

Requirements for niche customers include certifications like 'organic'. The market for organic avocado is relatively small, but demand is growing while the supply is limited. Note, however, that in order to market organic products in Europe, organic production methods that are in accordance with European legislation, must be employed, and an organic certificate must be acquired from an accredited certifier.

Implementing GRASP provides a good basic social certification. GRASP is part of GLOBALGAP, and is gaining in importance.[36]

Implementing standards recognised by SIFAV is another option. An initiative from traders and retailers, the SIFAV objective was to become 100 per cent sustainable in sourcing from Latin America, Africa and Asia by 2020.[37]

8.2.3 Prices

Table 67 France – average CIF prices (Euro/kg, mostly Hass)

	2019	2020	2021
Spain	3.74	3.74	4.01
Peru	3.24	2.71	2.70
Israel	3.05	3.20	2.69
Mexico	2.81	2.55	2.72
Kenya	2.53	2.36	2.42
Morocco	3.36	3.37	3.51
Colombia	2.92	2.65	2.49

Source: Trade Map: approx. weight per Hass avocado – 170g, 5 to 6 in a kilo
For the latest wholesale, retail and organic prices, refer to https://rnm.franceagrimer.fr/prix?AVOCAT

In terms of comparing France's import prices (Europe's largest avocado consuming market), Latin American supply sources and those from Kenya appear to be on the same footing at the lower end of the market, while Spain and Morocco maintain more premium prices.

According to CBI, Netherlands, supermarkets in Western Europe generally sell a good-quality avocado for between 1 and 1.5 euros per unit ('ready-to-eat' Hass quality). Organic avocados are sold with a premium of 20 per cent or even higher. Avocados that are unripened, or are of a lower quality, are sold for much less. Also, prices in street markets are usually lower than those in supermarkets. When trade prices are rising, the retail market can resort to smaller sizes of avocados, and in this way they can maintain a similar price per unit.

36 https://www.globalgap.org/uk_en/for-producers/globalg.a.p.-add-on/grasp/index.html

37 https://www.idhsustainabletrade.com/resource/sifav-basket-standards/

8.2.4 Market channels

Ripening and re-packing is generally conducted in-market by importers and wholesalers who supply supermarkets, specialised fresh produce stores, organic stores, open market retailers and the food service industry (hotels and restaurants). Avocados are sold mainly in supermarkets. Large retailers and north-western Europe are premium markets, whose customers generally consume high quality and 'ready-to-eat' avocados. Eastern Europe and Spain are also able to absorb avocados that have other qualities.

Trade fairs and prospective buyers

- Fruit Logistica
- Biofach
- ANUGA
- SIAL

Table 68 Prospective buyers

Company	Website	Product
Bakker Barendrecht	www.bakkerbarendrecht.nl	avocado
Nature's Pride BV	www.naturespride.eu	avocado, mango, sweet potato
Bratzler & Co. GmbH	www.bratzler.com/en	avocado
Minor, Weir & Willis Ltd	www.mww.co.uk	sweet potato, mango
Greencell Ltd.	www.greencell.com	avocado
Port International	http://www.port-international.de/en	sweet potato, avocado
JMF	https://www.jmfpartenariat.com	avocado
BR Fresh Exotics BV	http://www.brfreshexotics.com	sweet potato, avocado
Beva Fruits	http://bevafruits.com	avocado

8.3 Avocado – China

8.3.1 Chinese market opportunities and insights for fresh avocado

China is a world leader in the production of fruits and vegetables: it has further realised a rapid increase in production, and imports have been driven by steady economic growth that has led to a rise in overall household income in the country. Consumption levels associated with the rise of this new middle-class have sparked greater consumer interest in the variety, freshness, convenience, and year-round availability of fresh produce.

The rapid expansion is partly due to improved handling infrastructure, partly to increased disposable income and partly to a growing desire for food that offers health benefits. According to Nielsen's recent Chinese Consumer Confidence Index, health has risen above income to become the top concern for Chinese urban consumers. Chinese consumers are increasingly willing to pay more for food with healthy attributes in order to keep fit, and to counter health issues: avocados come at the top of the list in the Chinese consumer's perception of 'healthy'. The Chinese are keen advocates of this 'butter fruit'.

That said, there is much capacity for expansion in the market, as awareness of the fruit and its benefits is still far from comprehensive. Avocado imports reached US$133 million in 2018, earning 11$^{th.}$ place in the rankings for fruits imported from abroad. This slid somewhat to 17th place in 2021 - in connection with supply disruptions resulting from the COVID pandemic.

Avocado has come onto the Chinese market at a phenomenal rate: as recently as 2014 the total imported volume was below 5,000 MT, in 2018 it was close to 45,000 MT – a nine-fold increase in five years.

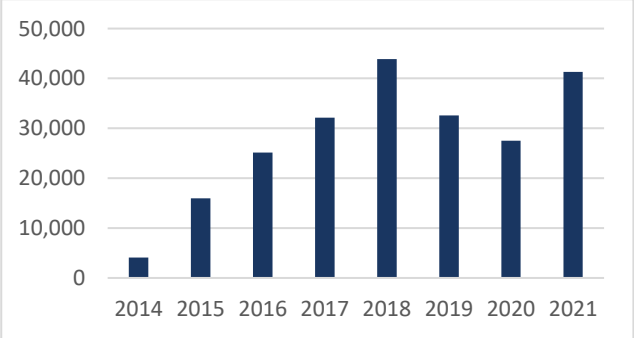
There has been limited commercial production of avocados in China to date. Currently, nearly all avocados in Chinese markets are sourced from Mexico, Chile and Peru. Colombia, the Dominican Republic, the Philippines and Kenya have also recently acquired approval from AQSIQ (General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China) to export avocados to the Chinese market. They are pre-dominantly shipped by sea to China and mainly arrive at Guangzhou and Shanghai, and are then distributed to different sales channels across China. Hass is the only avocado variety accepted in China.

Table 69 Top 25 Chinese fruit imports

	US$ million	CAGR 2017-21
Durian, fresh	4,205.2	66.1%
Other cherries, fresh	1,983.5	26.6%
Bananas, fresh or dried	1,039.7	15.7%
Mangosteens, fresh or dried	768.0	51.2%
Longan, fresh	705.5	12.7%
Kiwifruit, fresh	550.5	10.9%
Fresh grapes	535.4	-2.4%
Dragon fruit, fresh	526.7	7.8%
Oranges, fresh or dried	264.9	-8.8%
Cranberries, mulberries	212.9	19.5%
Longans and longan pulps, dried	203.7	22.2%
Plums and sloes, fresh	175.3	14.1%
Apples, fresh	151.0	6.9%
Pineapples, fresh or dried	150.6	0.8%
Grapefruit, including pomelos, fresh or dried	132.7	26.9%
Other fruit. Fresh	124.7	121.7%
Avocados, fresh or dried	109.7	0.6%
Other mandarins	83.5	7.9%
Peaches and nectarines, fresh	79.4	33.6%
Strawberries, frozen	62.6	32.4%
Sugar apple, fresh	55.0	18.5%
Dried grapes	44.6	0.6%
Wilkings	28.0	2.3%
Mangoes, fresh or dried	21.0	3.1%

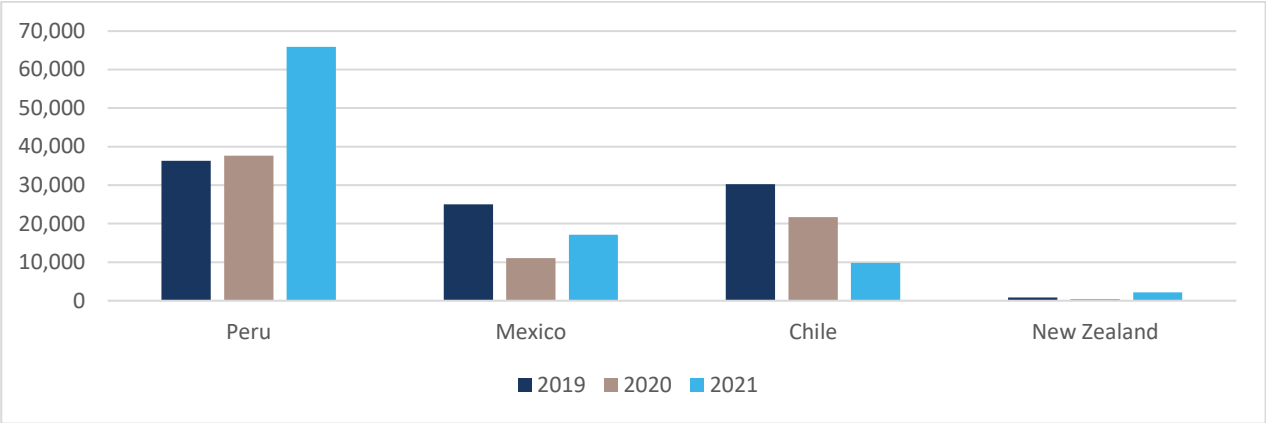
Source: Trade Map

Figure 50 Chinese imports of avocados, 2017-2021 (tons)



Source: Trade Map

Figure 51 Leading suppliers to China of avocados (US$'000)



Source: Trade Map

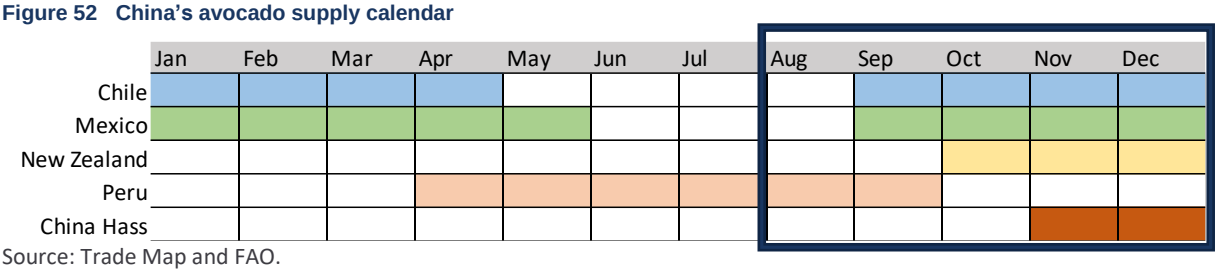
Although, in the past few years, the promotion of avocados has made good progress in first-Tier cities, many consumers still do not fully understand the nutritional value and consumption choices relating to this fruit, and are unable to achieve the right ripeness at home for the taste they desire (Freshplaza). Distributors promote avocado as a very nutritious fruit, containing healthy, unsaturated fats, proteins, vitamins, minerals, and other elements. Supermarkets and local importers, frequently in partnership with international brands like Camposol and Dole, make efforts to educate Chinese consumers through tastings and giveaways, so that they know how to tell if it is ripe, how to peel and how to best serve it. People like eating avocado on toast, with soy sauce, with noodles, in desserts, or in smoothies. Consumers talk about the fruit on social networks and share their recipes. More restaurants are also using avocados in their dishes. KFC's recent promotion of a chicken burger with avocados in the Chinese market is just such an example.

The establishment of the company Mr. Avocado, has also made a difference. Ripened fruit originating from the Mr. Avocado Ripening Centre, the first ever avocado-specific ripening centre in China, brought ripe and ready-to-eat avocados onto the market. Mr. Avocado has experienced rapid development: in March 2016, Mission Produce, Lantao International, and Pagoda signed a tripartite agreement to distribute ripe avocados under the Mr. Avocado brand in China, and just one year later – in April 2017 – avocados under the 'Mr. Avocado' label arrived in all Pagoda stores in Eastern China. In August, thanks to widespread promotional activities throughout the summer, Mr. Avocado was made available at all Pagoda stores across the whole country (Fruitnet).

Mr. Avocado, China's ripe-and-ready avocado brand, recently announced the establishment of Yunnan Avocado Agriculture Development (YAAD). In a partnership with the Institute of Tropical and Subtropical Cash Crops at Yunnan Academy of Agricultural Sciences, and the Yunnan Province Characteristic Industry Promotion Association, the new company will set up an avocado planting base in Baoshan, Yunnan, to focus on the research, development and production of domestic avocados. The first commercial crop is expected in 2022, the majority of which will be the Hass variety. Production is difficult to estimate with accuracy at this stage, but 100,000 MT per season has been mentioned (Fruitnet – 2018). This will have a major impact on the Chinese avocado market as a whole, especially on imported avocados. In the meantime, production is still at the level of 12,000 MT, as can be seen in Figure 53 below.

Assuming that Cambodia will have a similar season and time-to-market for avocados, as is the case in Thailand, the calendar in Figure 52 below suggests that this window would overlap with supply from all other major suppliers. But there would be several months of no competing supply from Peru.

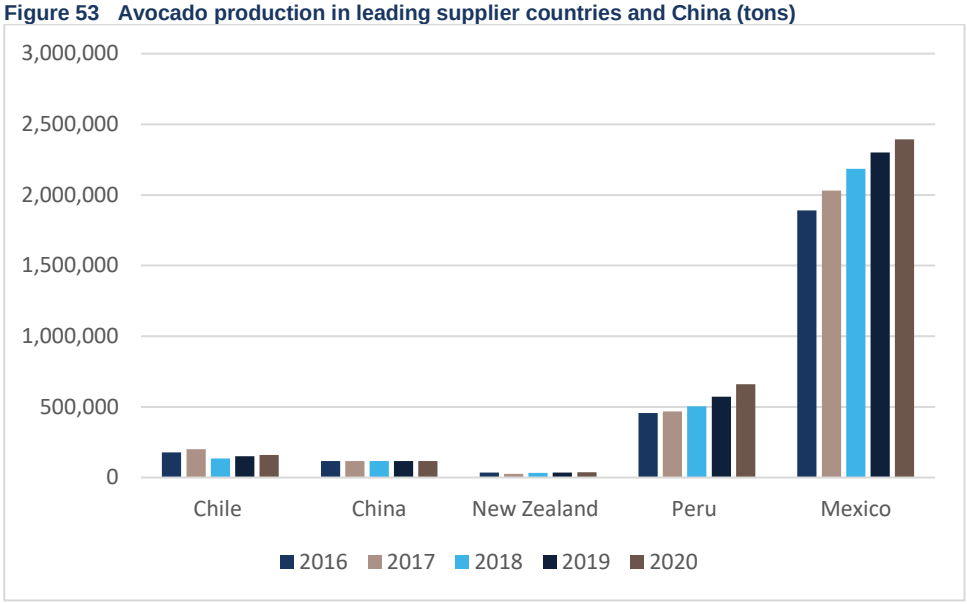
Figure 52 China's avocado supply calendar



Source: Trade Map and FAO.

* The Thai window (within the dark blue border) takes into consideration the harvest period for Hass and the estimated time-to-market. The assumption is that the Thai window would be similar to that of Cambodia.

Figure 53 Avocado production in leading supplier countries and China (tons)



Source: FAOSTAT

In 2020 Chinese avocado production remained at 117,338 tons, not yet impacting imports. The progress to watch will come in 2022 when the large plantings come to fruit. While consumption continues to expand, it is likely that the large-scale expansion in production may create disruption in respect of the import picture. At the same time, it should be noted that local production still has a long way to go in terms of bridging differences in quality.

According to a 2021 FreshPlaza article, the overall surface area devoted to avocado plantation in Yunnan has been expanding for the last few years. However, most of the avocado trees are too young for peak production, so the overall production volume per hectare is still small. And the Yunnan avocados cannot yet compete with imported avocados in terms of product quality. The article cites an avocado importer saying: 'There are several reasons for this situation. First, avocado farmers in Yunnan are not planting the Hass avocado variety that is so popular in the market, but grow the Pinkerton avocado instead. That is why the avocado supply from Yunnan is not matched with the market. It is possible that many farmers at the time were not sure which variety they planted. Second, the Yunnan avocado plantations are relatively new and the level of science and technology in plantation management is still rather low. The product quality still requires a lot of improvement.'

8.3.2 Market channels

Traditionally, imports of foreign fresh fruit and vegetables into China have found their way there via Hong Kong, transiting into mainland China via unofficial 'grey' distribution channels and transportation to major

wholesale markets along the coast of China. Thereafter they have been distributed to wet markets, supermarkets, and other wholesale markets in China's interior.

However, this model has evolved, and the present imported fresh fruit supply chain model in China is currently moving away from third-party aggregators, agents, and distributors and is moving toward more direct distribution models, such as direct import to Shanghai and Guangdong ports from foreign exporters.

Supermarkets and hypermarkets in China have witnessed generally consistent growth over the past decade at the expense of wet markets, independent shops, and individual convenience stores. However, wet markets remain the preferred sales channel for imported and domestic fresh fruit among many Chinese consumers.

A further important channel that must be acknowledged is China's massive sale of fresh fruit through online retail. One of the main drivers of this exponential growth has been sales of online fresh fruit; the online availability of fresh produce is quickly becoming a preferred purchase channel for Chinese consumers, especially for young professionals in Tier I cities.

8.3.3 Prices and tariff advantages

Table 70 Prices China – average CIF prices (US$/kg, all Hass)

	2019	2020	2021
World	2.84	2.60	2.62
Peru	2.81	2.40	2.54
Mexico	2.82	2.56	2.51
Chile	2.88	3.08	3.44
New Zealand	3.33	3.57	2.89

Source: Trade Map

The retail price is around US$2-US$3 per piece (mid-season: 80-100 yuan [US$12.36-US$15.45] per box of 5.6 kg (Freshplaza 2021)). Mexican avocados cost slightly more because of their bigger size. New Zealand avocados cost more – because of their premium quality.

Table 71 Comparative tariff advantages

Code	%	Tariff	Country
080440	**25.0%**	**MFN**	**Mexico**
	0.0%	**ASEAN-China FTA**	**Cambodia**
	0.0%	**China: Asian LDCs**	**Cambodia**
	0.0%	**China-Peru FTA**	**Peru**
	0.0%	**China-New Zealand FTA**	**New Zealand**
	0.0%	**China-Chile FTA**	**Chile**

Source: Market Access Map Database

Cambodia would benefit from the special market access it enjoys to the Chinese market in import duty terms, compared with Mexico, for which imports of avocado face a 25 per cent duty charge. Peru, Chile and New Zealand all have equal preferential access to Cambodia.

8.3.4 Relevant Chinese trade fairs and prospective buyers

- China Fruit & Vegetable Fair (China FVF)
- Fresh Asia Supply Chain
- IFE China
- SIAL China

- FBIE Shanghai
- ANUFOOD China
- FHC China

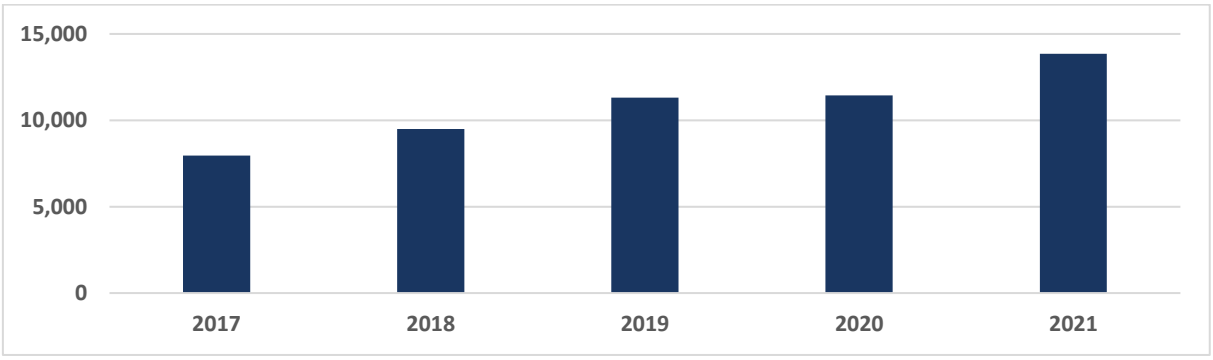
Table 72 Prospective buyers

Company	Product	Website
Jianyi Fruit (Foshan) Investment Co. Ltd.	Foshan	https://panjiva.com/Jianyi-Fruit-Foshan-Investment-Co-Ltd/34832440
Shenzhen Lihuaxin Import and Export Co., Ltd	Shenzen	https://cn.panjiva.com/Shenzhen-Lihuaxin-Imp-Exp-Co-Ltd/38477333
Berdafruit	Guandong	http://www.berdafruit.com/
Guangdong Foods V-mix Int'l Trading Co., Ltd.	Guangzhou	http://www.foodsvmix.com/en/index.jsp
Qinguo	Guangzhou	http://gzqinguo.com/index_en.html
Shanghai Xing Wan Fruits Co., Ltd.	Shanghai	http://www.xwfruits.com/English/
Wonong Fruit	Shanghai	http://www.wonongfruit.com/en/contact-us/
		http://www.supafresh.cn/en/

8.4 Avocado – ASEAN

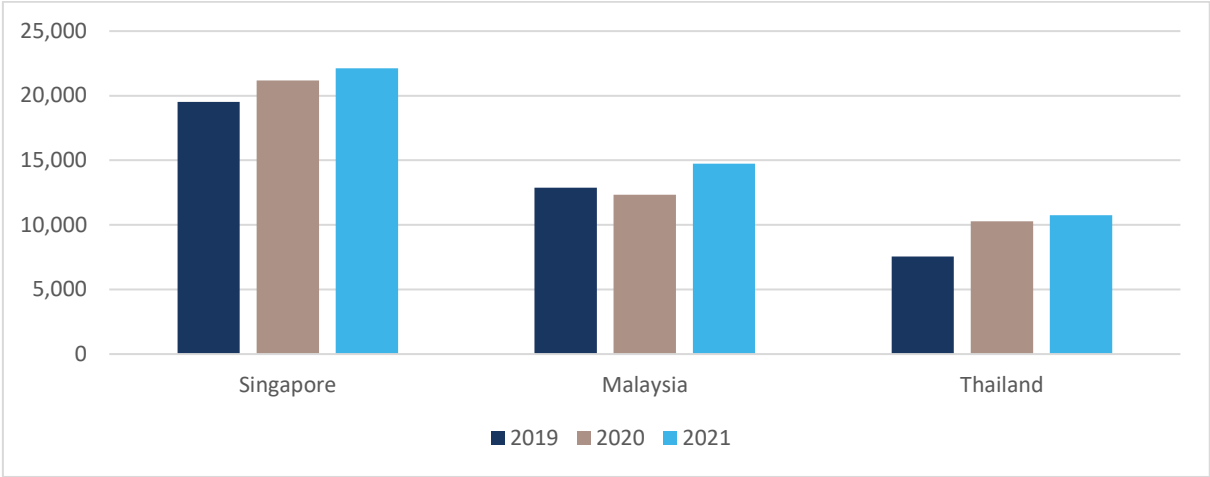
8.4.1 ASEAN market opportunities and insights for fresh avocado

Figure 54 ASEAN imports of avocado, 2017–21 (tons)



Source: Trade Map

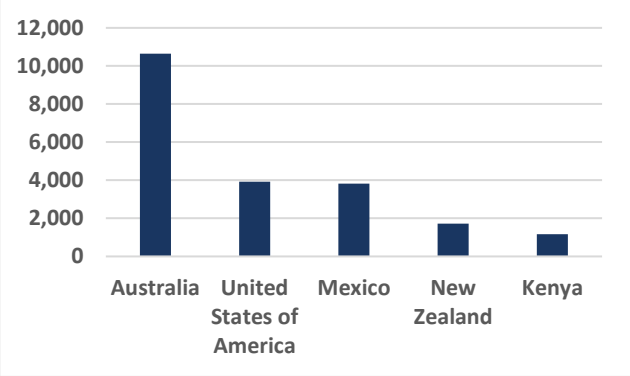
Figure 55 Main import markets in ASEAN for avocado (US$'000)



Source: Trade Map

Compared with China and Europe, the ASEAN market is small. Singapore, Malaysia and Thailand are the main markets, all three on an upward path. Australia is the leading supplier followed by Mexico, New Zealand and the United States with between 1/5th and 1/6th of the market.

Figure 56 Leading avocado suppliers to the ASEAN region, 2021



Source: Trade Map

According to a recent study by Queensland University:

- Singapore's avocado market is dominated by the Hass variety. Although the Shepard variety is available, it is sold mainly in the wet markets.
- Although large and small fruit is imported into Singapore, the demand for Australian avocado is usually focused on small fruit, with size counts of 28-32. Premium and Class 1 fruit are mainly imported, but Class 2 fruit is also brought in to cater for some food services. Small fruit of premium quality is preferred by grocery chain stores, such as Fair Price and Sheng Siong, because of the good value per piece. High-end supermarkets are channels that prefer premium avocados of a large size.
- Although Singapore has a good percentage of high-income customers willing to spend more on exotic and niche products (FreshPlaza, 2015), the fresh fruit market is competitive, with extremely price-sensitive retailers and consumers (ITA, 2018). Retailers often shop around to buy cheaper fruit, which challenges wholesalers and distributors who supply retailers.
- As Singapore is considered an open market in the region without any import restrictions, fruit is often re-directed to Singapore if it has failed to enter the protocol market (like China where approval is required) for which it was scheduled (FreshPlaza, 2015). This could have a negative impact on competitiveness and prices in the market given the small size of the Singaporean market and relatively large size of such re-directed shipments.
- Virtually all avocados are shipped by sea.

Traditionally, Malaysian and Singaporean consumers have preferred to buy avocados that are unripe and to let them ripen at home. But the markets are waking up to ripe and ready-to-eat concepts, and the Australian industry, backed by research and experimentation, has now convinced some retailers in those countries to embark on the associated investment: there is benefit to be gleaned from increased sales. To support the development of the 'Ripe and Ready' program, Avocados Australia, with the Department of Agriculture and Fisheries in Queensland, and the exporters involved in the program, has been providing support and training for importers and retailers in key markets, as well as tailored information brochures for consumers (FreshPlaza).

8.4.2 Comparative tariff advantages and prices

As Singapore has an open market policy, no quotas or duties are applied to imports of avocado from any country. There are, therefore, no advantages for Cambodia in comparison with suppliers from e.g., Mexico or the United States.

Table 73 Average Singaporean CIF prices for avocados, US$/kg

	2019	2020	2021
Australia	4.10	6.13	3.60
United States	3.83	3.96	4.85
Mexico	3.65	3.71	3.83
New Zealand	3.48	4.14	2.86
Kenya	2.32	2.30	1.89

Source: Trade Map

8.4.3 Trade fairs and prospective importers in Singapore

- World Food Fair
- Super Food Asia
- FHA Food & Beverage Asia
- Food & Beverage Trade Fair
- Asia Fruit Logistica (varied locations across Asia, incl. Singapore)

Table 74 Prospective importers

Company	Website
Khaishen	**http://www.khaishen.com/**
Fruitable	**http://www.fruitable.com.my/**
Chop Tong Guan (CTG)	**http://www.tongguan.com.my/**
Sheng Siong	**http://www.shengsiong.com.sg/**
Fresh Mart	**fmart.com.sg**
Fair Price Group	**https://www.fairpricegroup.com.sg/**
Singapore Fruits & Vegetables Importers & Exporters Association	**https://singapore-fruits-vegetables.org/members-listing/**

8.5 Avocados – Japan

8.5.1 Japanese market opportunities and insights for avocado

The Japanese market for fresh fruit and vegetables has traditionally been dominated by domestic suppliers, with imports limited to a narrow range of products. However, Japan has steadily increased import volumes in response to decreasing competitiveness in the domestic farm sector, natural disasters and the opening up of imports. In 2021, total imports of fresh and dried fruit to Japan were valued at US$2.92 billion (calculation from COMTRADE data). Bananas, kiwis and avocados are among the most imported fruits. Avocado ranks 3rd with imports worth a solid US$221 million. Japanese avocado imports maintained a 2 per cent per year growth over the 2017-21 period. Other fruits like kiwi, mandarins and apples, enjoyed a more rapid growth.

Table 75 Top 20 fresh and dried fruits imported by Japan (2021)

Fruit	US$ million	CAGR 2017-21
Bananas, fresh	978.5	3.6%
Kiwi fruit, fresh	457.6	9.9%
Avocados, fresh	221.9	2.0%
Pineapples, fresh	151.2	4.8%
Oranges, fresh or dried	121.9	-0.3%
Grapes, fresh	115.7	6.6%
Grapes, dried	86.7	-1.2%
Fresh or dried lemons	77.4	-6.7%
Grapefruit, including pomelos, fresh or dried	58.8	-10.5%
Other cherries, fresh	57.3	5.0%
Mangoes, fresh or dried	38.2	6.1%
Strawberries, fresh	38.2	5.8%
Prunes, dried	32.2	3.5%
Strawberries, containing added sugar	27.1	0.5%
Cranberries, bilberries, fresh	26.6	4.2%
Mandarins, fresh or dried	25.1	10.2%

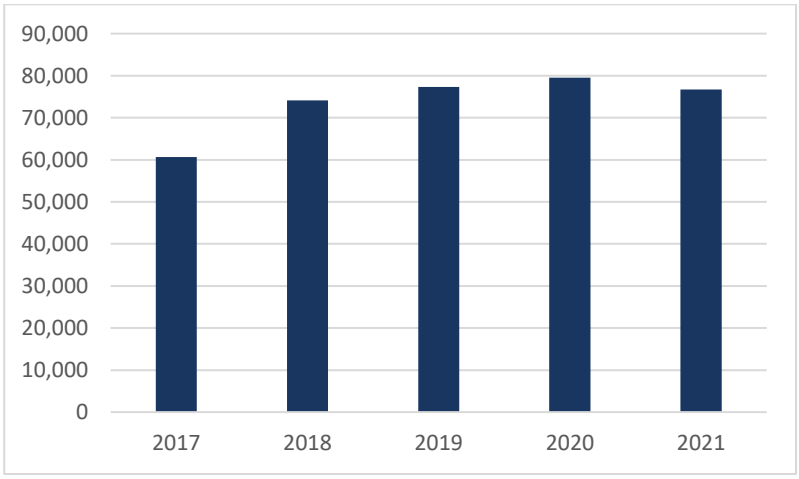
Melons, fresh	22.8	-3.0%
Apples, fresh	19.4	19.5%
Wilkings, fresh or dried	15.2	4.1%
Raspberries, mulberries, etc.	14.4	7.0%

Source: Trade Map

Japan has very recently started to grow some of its own avocadoes - Bacon and Pinkerton varieties – but, for the moment, the quantities are very small at less than 10 tons.

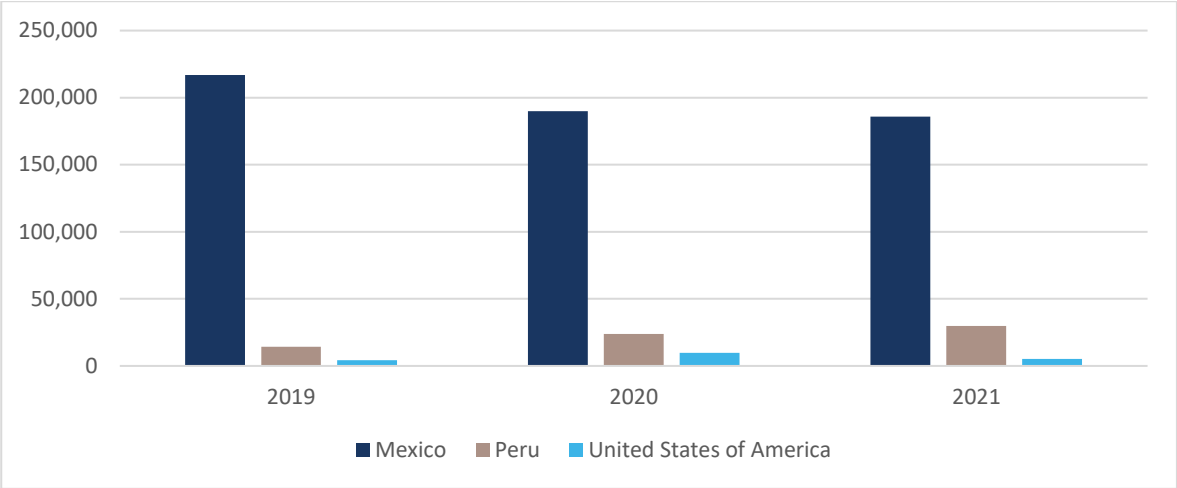
After its introduction to Japan, import volume of avocado has significantly increased in line with the global trend toward health and nutrition and the appeal of exotic products. It is now no longer uncommon to find them in supermarkets or even in some local restaurants. Back in 2002, imports were worth a mere US$25 million, but this has since increased almost 10-fold. Mexico has always been the main supplier to Japan with a 90 per cent share in 2019, and, since Peru gained access to the market, that country has also been making headways. The share of Mexico has tumbled to 83 per cent. The USA and New Zealand play a small role in the market, too.

Figure 57 Japanese imports of fresh avocado (MT)



Source: Trade Map

Figure 58 Japanese imports of fresh avocado – main supply sources ($'000)

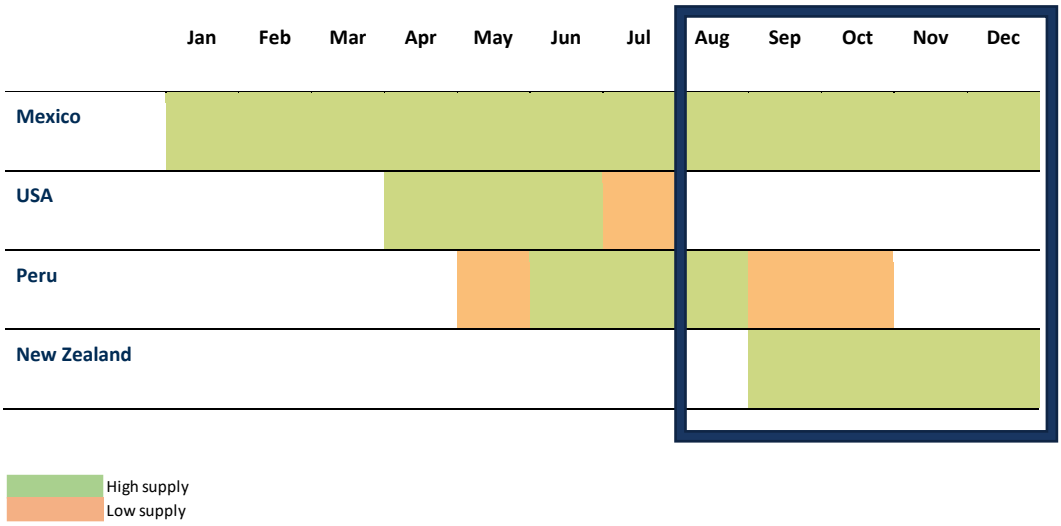


Source: Trade Map

Protocol market – countries permitted

Avocado	Mexico, Peru (2015), USA, New Zealand (2001), Chile, China, Australia (2018) Colombia (2019)

Figure 59 Japanese avocado market season window



Again, the Thai/Cambodia supply window is shown within the dark blue borders

Source: Trade Map

Mexico is able to supply the whole year round, while the other key suppliers have a shorter season/supply window - USA: April-June; Peru: June-August; and New Zealand: September-December. Following the

assumption that the Cambodian season/time to market falls in line with that of Thailand means that it would not coincide with the USA's supply period, and would be towards the end of Peru's annual supply.

8.5.2 Market Preference

Hass is the most accepted variety in the Japanese market. Avocado is often called 'butter of the forest' in Japan, which means that customers expect creamy and buttery-tasting avocado.

Avocados are especially popular among women as they are rich in vitamin E and minerals that are known to help keep skin smooth and moist, and to lower blood pressure. Moreover, avocado is gaining popularity due to the variety of recipes being shared on TV or social media (Ohta, 2017). As a result, consumers are increasingly eating avocados on a daily basis.

Appearance is very important in Japan. Japanese consumers prefer clean and safe products, and prices drop significantly the moment the fruit shows any signs of blemishes or spots.

The Japanese are very concerned about the nutritional content of fruit since they are a very health-conscious society. Information about the nutrition value of the fruit must be comprehensively reported on the label. The concern about the safety of imported products has been growing after a series of scandals about Chinese food. In order to ensure the safety and reliability of agricultural products in Japan, the introduction of GAP (Good Agricultural Practice) is being widely applied.

8.5.3 Trends

Increase in frozen vs. fresh fruit consumption. Due to the increasing number of women entering the workforce and the rising number of single-person households, there is a desire to save time when cooking. This has been leading to a shift from fresh fruits to frozen fruits, which are often pre-cut and require little preparation prior to consumption. At the same time, frozen products have a considerably longer shelf-life than fresh fruits, adding to their convenience as consumers do not need to make such frequent shopping trips. Furthermore, the stable price of frozen products will also support growth, as Japan has often experienced sudden price rises for fresh fruits in the last few years due to disasters and extreme weather events. These also hinder retail sales of fresh fruits.

Frozen avocado is also making its way into Japan; Burger King has, for example, initiated avocado into its Whoppers burgers, supplied to the company from Colombia in frozen form (Fruitnet).

Although **online retailing** for food and beverages is not as yet a big segment in Japan, it is developing rapidly (IBER global, 2016). Many major supermarkets now offer online grocery services in most parts of Japan, including premium as well as discounted fruit in bigger boxes.

Although **demand for organic food** is relatively small, Japanese consumer interest is slowly growing and there could be vast opportunities for suppliers provided that they can meet Japan's stringent standards. (www.food-navigator-asia.com)

Price and Tariff advantages

Table 76 Japanese imports of fresh avocado – main supply sources ($'000)

	2019	2020	2021
Mexico	3.06	2.77	2.88
Peru	3.18	2.84	2.78
United States	4.95	3.91	4.27
New Zealand	3.61		2.99
Australia	4.66	4.15	4.31

Source: Trade Map

With respect to avocado, Cambodia does not enjoy much of a tariff advantage against key suppliers like Mexico, Peru, Thailand and USA, who face 3 per cent vs Cambodia's 0 per cent.

8.5.4 Trade Fairs

- FOODEX Japan 2023, March 7-10, 2023, Tokyo Big Sight, Tokyo
- FABEX Kansai 2022, September 7-9 2022, Intex Osaka, Osaka
- FABEX Kansai is for the food market in Kansai area and west of Japan
- Supermarket Trade Show 2023, February 15-17, 2023, Makuhari Messe, Chiba

8.5.5 Importers

Prospective importer	Website
Funasho Shoji Co., Ltd	https://www.funasho-s.co.jp/eng/index.html
Nangoku Fruits	https://nangoku-f.shop
Royal	http://www.royal-jp.com/
Delta International	http://www.delta-i.co.jp
Marusei Trading Co., Ltd.	http://maruseishoji.com/
Robson Corporation	https://www.robson.co.jp/en/home

8.6 Avocado – South Korea

8.6.1 Korean market opportunities and insights for avocado

After signing several FTAs in 2003, South Korea opened the gates to its fruit market leading to a continuous steady increase in fruit imports. South Korea's fresh and dried fruit imports expanded from 350,000 tons in 2002 to 730,000 tons today (Trade Map). Demand for dietary diversity continues to drive further growth in fruit imports, with several fruit categories like kiwifruits and durians still showing high average annual growth rates. Avocado, South Korea's 8th most imported fruit, has also been showing dramatic growth in imports - up from 6,000 tons in 2017 to close to 18,000 tons in 2021.

The reason for the craze? Avocados are healthy, look pretty on Instagram, and hint at opulence. As Steve Trickett, who manages sales at the New Zealand-based grower Just Avocados, said in an interview with produce industry publication FreshPlaza: 'Korean consumers are very health conscious and a significant percentage of the population have good disposable incomes.' (Forbes)

As avocados have to date not been cultivated in South Korea, the imports represent the country's entire demand.

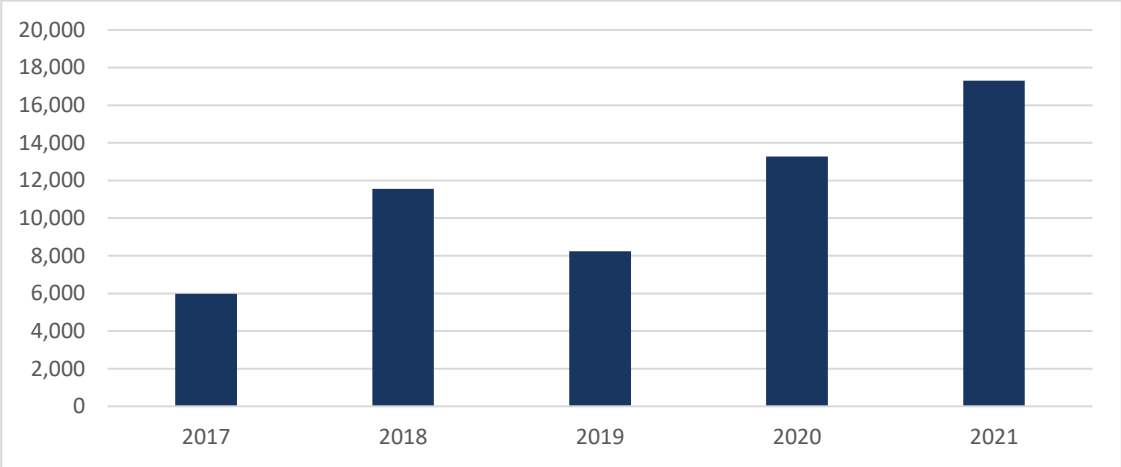
Table 77 Top 20 fresh and dried fruits imported by Korea (2021)

	US$ million	CAGR %. 2017-21
Bananas, fresh or dried	290.2	-7
Oranges, fresh or dried	198.5	-5
Fresh grapes	172.3	3
Fresh cherries	168.0	-1
Fresh kiwifruit	145.5	20
Mangoes, guavas and mangosteens - fresh or dried	98.8	13
Pineapple, fresh or dried	52.6	-7
Avocados, fresh or dried	50.4	9
Lemons and Limes, fresh or dried	42.2	-1
Fresh cranberries, bilberries	36.0	18
Fresh tamarinds, cashew apples, jackfruit, lychees, sapodilla plums, passion fruit, etc.	33.9	23

Grapefruit, fresh or dried	25.0	-6
Frozen strawberries	18.0	1
Dried grapes	10.3	-3
Dried peaches, pears, papayas, tamarinds	7.6	1
Dried prunes	6.6	14
Fresh durians	5.1	33
Fresh or dried figs	3.6	15
Fresh melons (excluding watermelons)	2.9	16
Frozen raspberries, blackberries, mulberries, etc.	2.6	12

Source: Trade Map

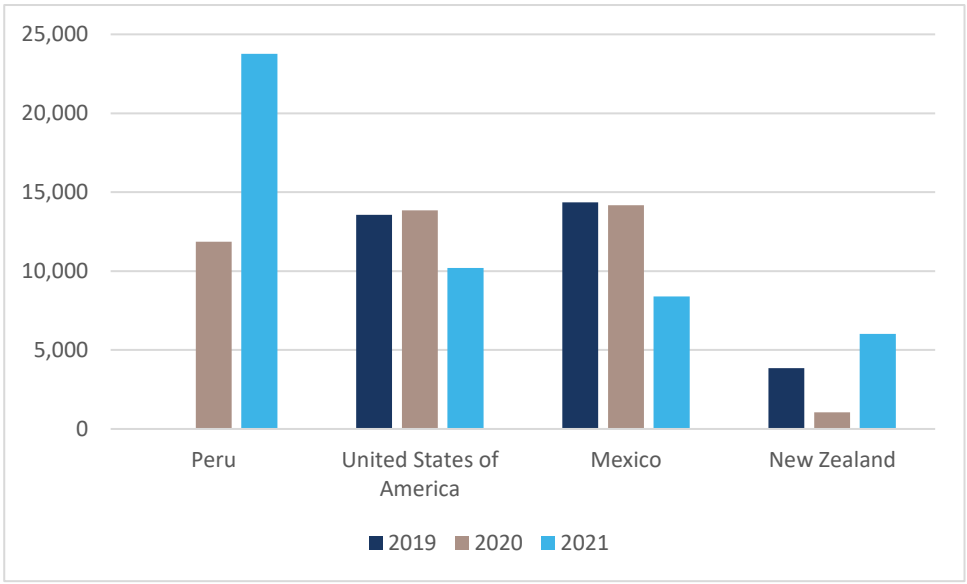
Figure 60 Korean imports of avocado (MT)



Source: Trade Map

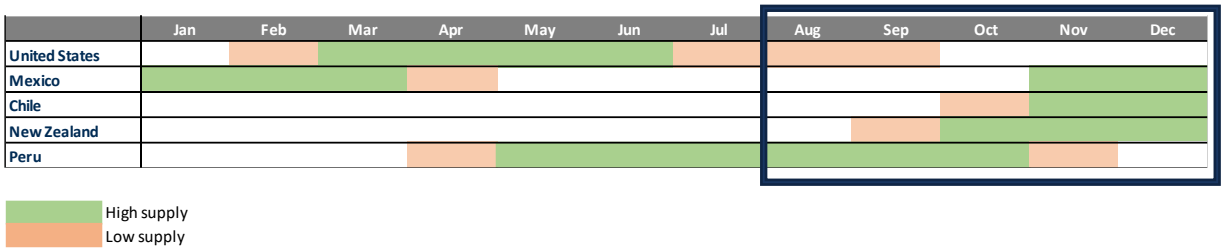
After gaining access approval to Korea in 2019, Peruvian avocados have hit the market by storm and that country is now a leading supplier along with the United States, Mexico and New Zealand. Mexican supply is centrally organised in the designated Korean export complex of the state of Michoacan. Peruvian and Mexican approved supply is specifically only for the Hass variety. In fact, according to a University of Queensland report, Hass is the only variety available in Korea, which makes sense since all of the avocados are imported and Hass is the variety most suited to enduring international shipping. Chile and Colombia are the latest additional suppliers to be approved and entered the market with first shipments in 2020 and 2021, respectively.

Figure 61 Korean imports of avocado – main supply sources ($'000)



Source: Trade Map

Figure 62 Season window



Source: Trade Map

8.6.2 Trends

Online retailing of fresh produce is taking off in South Korea in response to growing demand from consumers. The online grocery market is expanding in South Korea, with demand for delivery services rising among young people living alone, and childless couples. Both demographic groups are growing in Korea (Fruitnet.com). According to the Korea Statistics Office, online food and agricultural sales in Korea increased 61 per cent in 2020, compared with the 17 per cent growth in overall online retail sales.

Sensitivity to safe and healthy food products – The ever-strengthening interest of South Korean consumers in, and sensitivity to, safe and healthy food products is a well-established trend. Used in their everyday language, the term 'well-being food' refers to food products or ingredients that are advertised as having functional health benefits. This trend is a significant driver behind the continued strong demand for avocado with its great health benefits.

8.6.3 Price and Tariff advantages

Table 78 Average CIF Prices, US$/kg

	2019	2020	2021
Peru		2.84	2.60
United States	4.99	4.60	5.05
Mexico	3.09	2.55	2.44
New Zealand	4.35	3.83	2.79
Chile		3.93	3.62

Source: Trade Map

Table 79 Tariffs Applied to supply countries by South Korea for avocado imports

Regime	Tariff	Competing suppliers
MFN	30%	Peru, Mexico, United States, Colombia, New Zealand
ASEAN	0%	Cambodia, Thailand
LDC	0%	Cambodia

Source: Market Access Map

Given that all the avocados are Hass variety, CIF import prices can be compared across the various supply sources. Peru and Mexico appear to battle at the lower end with prices also declining over the past three years, while the United States maintains a higher-end position.

In terms of the tariff advantages Cambodia could enjoy in the event that its avocados were to be approved, a significant advantage could be had of 30 per cent versus all the current approved suppliers.

9 Palm Sugar

9.1 Product definition

Coconut sugar and palm sugar are sweeteners that have been growing in popularity, loved for their pleasant, deep flavour, natural sweetness and low glycemic index (GI). A low GI would be under 55; a moderate GI ranges from 56 to 69; and a high GI is any number over 70. Palm/coconut sugar has a GI of 35 to 54 (as it is not factory-refined, the GI has quite a high level of variance). White and brown sugars have a GI of around 64, putting them into the moderate category.

Palm/coconut sugar also contains traces of minerals such as potassium, iron, calcium and zinc. (It should be added here, however, that even though the mineral content of coconut/palm sugar is an important element of marketing, far more than a teaspoon or two in coffee or on breakfast cereal would be needed to reap the same nutritional benefits as are offered by a banana, or a serving of dark green vegetables.)

In international markets, palm/coconut sugar is mainly available in granulated form, unlike the paste form which is often the locally available variety.

While palm/coconut sugar have a lot in common, they are not the same. Palm sugar comes from the trunk sap of the *Arenga pinnata* and *Borassus flabellifer* trees, also known as the sugar palm or date palm tree. In contrast, coconut sugar is sourced from numerous different varieties of the *Cocos nucifera* tree by collecting the sap from the blossom.

Table 80 Some further agronomical differences

Type	Arenga / Palm Sugar	Coconut Sugar
Height (tree age)	**14-20 m**	**15-40m**
Initial fruiting at…	**5 years old**	**7-8 years old**
Productive period	**7-8 years**	**40-45 years**
Litres of sap per day	**20-80 litres**	**5–10 litres**
Sugar yield per day (average)	**6.7 kg**	**2.3 kg**

Source: Grow Asia/Ananda Ventures

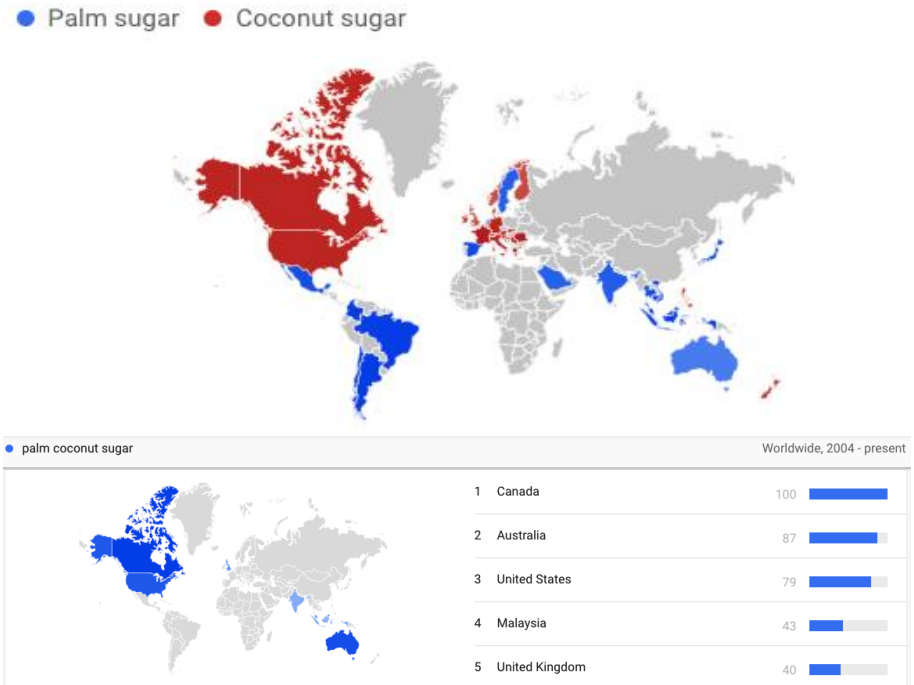
The colour of palm sugar is slightly darker and some would claim that the aroma of palm sugar is more distinctive.

Recommendation: The final products are quite similar to each other, or are even perfect substitutes, leading numerous manufacturers and retailers in certain markets to merge the two into 'Coconut Palm Sugar'. More frequently, however, the term 'coconut sugar' is better known, and, in certain markets, the description of 'palm sugar' may not be recognised by consumers. A direct example of this can be seen through the use of Google Trends: there is a significantly higher occurrence of the query topic 'coconut sugar' in New Zealand, Canada and the United States, and in north-west Europe, while the query topic 'palm sugar' occurs more frequently in Australia, Spain and Sweden.

Image source: http://organiccoconutpalmsugar.com/

However, in the case of Australia, the second map shows that most queries relate to 'palm coconut sugar'. This also reflects the description used by the vast majority of Australian wholesale suppliers and in the media.

Figure 63 Location of palm sugar, coconut sugar and palm coconut sugar



Source: https://trends.google.com/trends/explore?date=all&q=%2Fm%2F094r11,%2Fm%2F0g9twx4

An indication of the quality of palm sugar relates to its colour: if it is too light, this suggests that the sugar may be contaminated with white or cane sugar, too dark, that the sugar has been overheated, which affects the flavour. Adulteration of palm sugar is a practice that has been emerging to increase the supply. In addition, the consistency should not be too hard but rather crumbly. To ensure a good quality palm sugar, processors/exporters need to introduce quality management and control measures. Minimising time between harvesting and the processing of the palm juice helps.

9.2 Trade classification

Palm or coconut sugar does not have a trade classification of its own. As several, not quite specific, classifications are used by international traders, trade flows cannot be analysed with certainty.

9.3 Status of the Cambodian palm sugar sector

In Cambodia, there is a large untapped base (Palm = 3m trees – 1m tapped; Coconut = 13.4m trees – none tapped) (Grow Asia/Ananda Ventures, 2017). Production reaches 14,000 MT per year, of which 109 MT was exported in 2019. The majority of the production goes to the domestic market. Export produce is granulated, as opposed to the locally traded and consumed paste. If the 14,000 MT of annual production were all granulated this would convert to the equivalent of 9,000 MT. In other words, there is ample resource for further export expansion.

In comparison, the Philippines exports 400 MT and has a total production of 20,000 MT of coconut sugar, and Indonesia produces 400,000 MT of coconut sugar. Exports from that latter country are growing but the actual amount is unknown. Both the Philippines and Indonesia produce only coconut sugar, while Cambodia produces only palm sugar. Indonesia and the Philippines have year-round harvests, while Cambodia's lasts from December to May. Yield in the Philippines is five times higher than it is in Indonesia and Cambodia. A likely contributor to this much higher yield is their use of ladders and bridges between coconut trees to aid harvesting, in place of pole ladders or climbing as is the case in Cambodia (Grow Asia/Ananda Ventures).

Kampong Speu province, which has sandy soils and low rainfall, is particularly well-known for its tasty, concentrated and aromatic sugar, and has managed to obtain Geographical Indicator (GI) status in Europe.

Producers in Cambodia have started to move up the value chain as farmers have also begun to produce granulated sugar and to sell it to exporters. Several companies have achieved remarkable success in Cambodia including the pioneer Confirel, which has managed to coordinate small producers to export a high quality, mostly organic, product. More small producers can be brought into a coordinated chain for further expansion.

At the same time, the Cambodian palm sugar sector is facing several growth constraints:

Labour challenges. Tree climbers are ageing, while the younger generations are moving to cities to work in garment factories and in other service sectors and prefer to avoid the danger of tree climbing. This has a negative effect on this industry, which is labour-intensive: workers spend up to 6.5 hours/day climbing trees, and another 6 hours/day processing sap (Grow Asia/Ananda Ventures, 2017).

Smallholder farmers with limited investment. There is limited investment capital and a lack of technical skills to maximise production and optimise quality. There is also a lack of investment in facilities to store the product in order to facilitate year-round supply. The academic Rithysen Men suggests several means to tackle these issues in his article in the *Australian Agribusiness Perspectives*, 2019, through:

- capital investment
- improvement of production – training in quality control and production techniques is necessary in order to produce good quality products. Although some producers have been trained in this, many more have not. The majority of producers use conventional cookstoves that could be replaced by more efficient techniques

- contract farming – while some contracts have been signed with producers or associations, a more intensive contract farming approach could lead to increased investment and better productivity.
- R&D – since palm sugar is emerging as a commercial commodity, it is important to document lessons learnt, opportunities and challenges. Further research on market analysis is also necessary because the global market for sugar substitutes is growing rapidly.

Recommendation: Another observation would be to assess the feasibility of following the Philippine's method to harvest higher yields using ladders and bridges between trees. At the same time the big question remains – are there possibilities to develop coconut sugar? And, hence, is it also possible to introduce dwarf trees as has been successful for coconut sugar production in countries like Malaysia?

9.4 Palm Sugar – Europe

9.4.1 Opportunities and insights into the European palm and coconut sugar market

As palm and coconut sugar do not have a clear trade classification, estimates are needed. CBI, Netherlands, quotes estimate from industry sources for the total European market for palm/coconut sugar of between 1,500 and 3,000 tons. This is a small segment of the total sugar market in comparison with European imports in 2019, which amounted to 8.5 million tons of cane and beet sugar.

Limited awareness about price (significantly higher than that of regular sugar) has meant that adoption in the European market is still slow. Consequently, palm sugar is more common in north-west Europe. In fact, many suppliers of new and innovative food products choose to introduce them to the United Kingdom first. Other north-western European countries usually follow, and eastern and southern European countries are often the last to adopt a product. The early adopter consumers in north-west Europe usually have relatively high disposable incomes and are able and more willing to pay a premium price for these products. As a consequence, they will also perceive the product as falling into the premium or luxury category – considering also that its GI is not hugely different to that of sugar. The choice is governed by the product's 'naturalness', smoky flavour, healthy minerals and slightly lower GI. As a luxury product, it is more likely that consumers will prefer it to be organic. In fact, most palm sugar demand in Europe is for 'organic'. It is likely that consumers will also appreciate, and be prepared to pay a premium for, Cambodia's Protected Geographical Indicator (PGI status) of Kampong Speu.

The main markets for palm sugar in Europe are the UK, Germany and the Netherlands. And the prospects are favourable for palm sugar, with several trends and industry applications driving future growth. These include the fact that consumers are increasingly seeking alternative, healthier sweetening options to replace regular cane or beet sugar: popular types include birch sugar (xylitol), honey, agave nectar, erythritol, maple syrup, palm sugar and stevia. According to Grandview Research, the global alternative sugar market was worth US$13.7 billion in 2016 and will continue to grow up until 2024 with a CAGR of 4.2 per cent. Stevia has been adopted on a larger scale after some years of resistance from sugar companies – they are now the main buyers, including 'healthy' alternatives in their product offering.

Recommendation: Food manufacturers – e.g., also covering confectionery, beverages and chocolates – are increasingly using stevia as an ingredient, but the battle is how to mask stevia's bitter flavour. An option for marketing palm sugar, therefore, is to stress its lack of a bitter flavour.

Cosmetics application. Coconut sugar has amino acids, which play an important role in the production of collagen within the skin. This makes it an excellent anti-aging ingredient for cosmetics.

- In general, demand for natural ingredients is growing. This is also a factor that contributes to demand for the product.

In addition, consumers are increasingly interested in products that are ethically sourced. An important dimension of coconut sugar – that should be highlighted to consumers by export marketeers – is that less than 1/5th of the soil nutrients and water are used for its production than is the case with sugar cane.

- Trends also dictate sales channels. Very frequently, the trade channel is more aligned with 'organic' supply rather than sugar or sweetener. So, palm sugar is more likely to be found in an organic shop.

Similarly, traders of coconut products become the channel (riding on the hype of coconut products in general – e.g., coconut cooking oil is popular at the moment). These traders will want to offer one more coconut product in their 'coconut assortment': 'coconut' palm sugar. Super-food traders will also include palm sugar in their range of 'healthy' and 'exotic' products. Regular sugar importers are unlikely to trade in palm or coconut sugar as the volume is so small compared with that of regular sugar.

9.4.2 Private standards

Buyers will often experience demands in respect of, for example, food safety, that are more stringent than those of the mandatory legal requirements. For legal requirements refer to Annex I.

Buyers commonly require their suppliers to have a quality/food safety management system in place. These systems require companies to demonstrate their ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. In addition, suppliers can apply a basic HACCP system. However, if they aim to supply food manufacturers more directly, instead of through various traders, it is necessary for them to have a certified food safety management system recognised by the Global Food Safety Initiative, such as ISO22000, BRC or IFS.

Producers offering ethically-traded palm sugar are currently not able to benefit from the widespread recognition offered by the Fairtrade label in Europe. Fairtrade International does not yet have a standard for palm sugar production so it is not possible to certify its producers.

9.4.3 Prices

Table 81 Retail prices

Type	Value	Euro/kg
Sainsbury's Palm Sugar (granular)	**GBP 2.70 125g**	**24.40**
Biona Organic – Coconut Palm Sugar (granular)	**GBP 2.99 250g**	**13.52**
Verival – organic, granular	**EUR 17.96 1kg**	**17.96**
Sucre de coco bio – Carrefour (granular)	**EUR 3.05 230g**	**13.26**
Kokos Bloemsuijker – AH Netherlands (granular)	**EUR 3.55 350g**	**10.30**

According to CBI, Netherlands, price mark-ups across the distribution chain in Europe work out as: CIF – import, packing and distribution to wholesaler (+25 per cent); wholesaler distribution to retailers (+20 per cent); and retailers (+30 per cent).

9.4.4 Trade fairs and prospective importers

- SIAL (www.sialparis.com)
- Food Ingredients Europe (fieurope.ingredientsnetwork.com)
- Anuga (www.anuga.com) in Cologne, Germany
- Alimentaria (www.alimentaria-bcn.com)
- Biofach (www.biofach.de) in Nuremberg, Germany (for organic producers)

Table 82 Prospective importers

Company	Website
Rapunzel	**https://www.rapunzel.de/**
Raw-Superfood	**http://www.raw-superfood.com/**

RealFoods	**https://www.realfoods.co.uk/**
Naturata	**https://www.naturata.de/**
Mattisson Arenga	**https://www.mattisson.nl/**
Super Nutrients	**https://www.supernutrients.co.uk/**

9.5 Palm Sugar – Australia/New Zealand

In Australia and New Zealand the interest in palm/coconut sugar for healthier eating is similar to that in Europe. Also, the fact that, compared with cane sugar, it is a higher-end product, is supported by interested consumers who are less price conscious and, therefore, also have a preference for the palm/coconut sugar to be organic.

According to research carried out in 2018 by the Nielsen and the George Institute, Australian consumers are becoming aware of the sugar content in foods and are already showing a change in purchasing behaviour when it comes to sugar-laden products. Three in ten Australians are reported to be 'very concerned' about sugar consumption and are also seeking products that are 'more natural'. In this environment, palm sugar will attract more attention.

At the same time, much media attention in the form of blogs, and so on, about nutrition is focusing on advice in respect of the pros and cons of alternative sugars. There are frequent references to the fact that palm/coconut sugar, although healthier than cane sugar, still contains a lot of calories, and thus consumers are more persuaded to consider other sweetening alternatives.

Environmental and sustainability awareness is high in Australia and New Zealand and consumers from these countries would, therefore, be inclined to choose a much more 'sustainable' sweetener over cane sugar.

Markets in Australia/New Zealand are more inclined towards coconut sugar and their traditional supply ties with Indonesia – although it is also sourced from Sri Lanka, the Philippines and Thailand.

Some importers/wholesalers, such as Australian Organic Products Pty. Ltd. and Maretai Organics, do re-package their products, and some pre-packed brands are also presented by retailers e.g., Thandaroo from Thailand.

In a sense, coconut/palm sugar has progressed a step further in the Australian market compared with the European market in that the main sugar brand also offers coconut sugar as part of its assortment.[38] (A similar process played out with stevia. For a long time, the monopolistic sugar companies tried to sway public opinion against stevia, and then changed tack and decided instead to embrace it and include it in their assortment. Now, big sugar companies are by far the largest buyers of stevia.)

Coconut/palm sugar is particularly in demand among Australian consumers who are diabetic. In 2017–2018, one in 20 Australians (4.9 per cent or 1.2 million people) had diabetes. This represents a substantial increase from 3.3 per cent, which was the percentage in 2001 (Australian Bureau of Statistics). The diabetic rate of Australians is not as extreme as it is in the UK, where one in ten people over 40 years old has the disease. Not only is palm sugar better for diabetics, but it is also believed to prevent the disease. This will remain a marketing point for palm sugar, despite the fact that many nutritionists point out that palm sugar does not achieve the highest score in comparison with other sugar alternatives.

Australia/New Zealand palm/coconut sugar prices

- Retail grocery AUS$1.09/100g (Thai branded)
- Coconut sugar organic AUS$1.60/100g – (Australian importer branded)
- Organic shops online AU$7.95 – 500g, Australian importer branded coconut sugar ~ AUS$1.59 – 100g

38 **https://www.csrsugar.com.au/csr-sugar/our-products/specialty/coconut-sugar**

- Organic wholesalers: AUS$27.70 5kgs Coconut Sugar ~ AUS$0.55/100g, origin: Indonesia – ACO (Australian Certified Organic).[39]

Australia/New Zealand trade fairs for prospective importers

Table 83 Australia/New Zealand trade fairs

Company	Website	Location	Date
Naturally Good	**http://www.naturallygood.com.au**	**Sydney**	**June**
Glutenfree Food Expo	**http://www.glutenfreefoodexpo.or**	**Brisbane**	**June**
Glutenfree Food Expo	**http://www.glutenfreefoodexpo.or**	**Sydney**	**August**
Adelaide Food and Cooking	**http://www.kjex.com.au**	**Adelaide**	**October**
BioFach India	**http://www.biofach-india.com**	**Delhi**	**November**

Table 84 Prospective importers

Company	Website
Global Organics	**www.globalorganics.com.au**
The Goodness	**www.goodness.com.au**
Terra Madre	**www.terramadre.com.au**
Gluten Free Wholesalers	**www.glutenfreewholesalers.com**
Maretai Organics	**https://maretai.com.au**
Premier Gourmet Food	**https://premiumgourmetfood.com.au**
Davis Food Ingredients	**https://davis.nz**
Zeninan Organic	**https://zenian.co.nz**

10 Sesame

10.1 Product definition

Sesame seeds (*Sesamum indicum*) are grown primarily for the production of oil for cooking, but also for use as toppings on bakery products such as bread, bagels, hamburger buns and confectionery (sweets). Sesame seeds are present in snacks, salads (seed, dressings and sauces) and crackers. Restaurants and natural food consumers also purchase sesame seeds for use in food such as tahini, humus, sushi and Middle Eastern desserts.

Black sesame seeds are used in cosmetics to combat a variety of skin and hair problems on account of their high antioxidant properties. In addition to being rich in antioxidants that can detoxify the skin, black sesame seeds have anti-inflammatory properties, iron, and vitamins B and E. Both the oil and the seeds of

39 **https://www.terramadre.com.au/product/coconut-sugar-organic-5kg**

black sesame can be used for most skin types and are also safe for babies. These factors have propelled demand for the product.

Sesame seed oil, and ingredients derived from it, have become important in the formulation of a variety of cosmetic products including moisturisers, lipsticks and other make-up products, sunscreen products, skin cleansers and hair products. Sesame seed oil is also used for producing soaps. The demand for natural and chemical-free ingredients has surged in the personal care industry. Therefore, a variety of soaps is produced using natural ingredients such as sesame seed oil, and it is also used in various other personal care products such as massage oils and lotions. Furthermore, sesame oil is used in the production of margarine and pharmaceutical products.

Sesame seed oil-cake, the remains after oil production, is high in protein content and minerals, and is, therefore, in demand for animal feed.

There are different types and qualities of sesame seeds. White seeds are a white-to-golden colour and demand a higher market price than mixed seeds, which range in colour from yellow to dark brown. Sesame seeds come in many shades depending on the cultivar harvested. The most traded variety is off-white.

White sesame seeds are mostly used in the bakery industry for both the preparation and garnishing of many desserts, appearing on top of burgers, donuts, and other dishes.

The white and other lighter-coloured sesame seeds are common in Europe, the Americas, West Asia, and the Indian subcontinent. The black and darker-coloured sesame seeds are mostly produced in China and Southeast Asia.

Recommendation: This does not mean, however, that is not possible to grow white sesame in Cambodia. In Myanmar and in China white sesame is being increasingly cultivated in response to rising demand.

Some pioneer farmers have already caught on to this and have started producing white sesame (currently unofficially) for export to Vietnam. According to the Provincial Department of Agriculture, Forestry and Fisheries, around 1,000 ha of white sesame is being planted in both Kampong Cham and Tboung Khmum provinces. The yield is quite low at between 500kg to 1ton per hectare. Almost all of the white sesame harvest is exported informally to Vietnam.

In addition to colour variation, seeds differ in terms of whether they are hulled or un-hulled. This can be due to a lack of hulling processing facilities, or, for certain cuisines and applications, the intact hull is preferred. Un-hulled seeds have a crunchier texture compared with hulled seeds, and may have a slightly more bitter flavour. They are also richer in calcium.

The buying price of sesame for export is largely determined by the evenness of the colour, taste, dryness and purity. Hulled seeds and bleached hulled seeds have a higher market value than untreated seeds. The purity of the sesame seed is specified on a scale of 99 to 1 – the higher figure, 99, means that in each 100 grams of sesame seed, no more than 1 per cent contains impurities such as dirt, branches, stones, and so on.

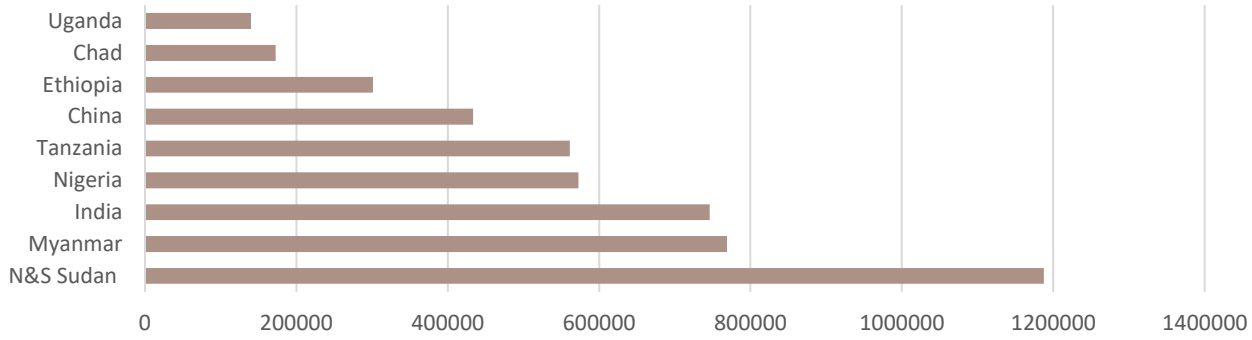
Table 85 Trade data classification

	Code	Label
EU	**12074090**	**Sesamum seeds, not for cultivation**
China	**12074090**	**Sesamum seeds, not for cultivation**
Thailand / Singapore /	**12074010**	**Sesame seed, edible**
Indonesia	**12074090**	**Sesame seed, other**
Australia	**1207400011**	**Sesamum seeds, whether or not broken**

New Zealand	**120740**	**Sesamum seeds, whether or not broken**

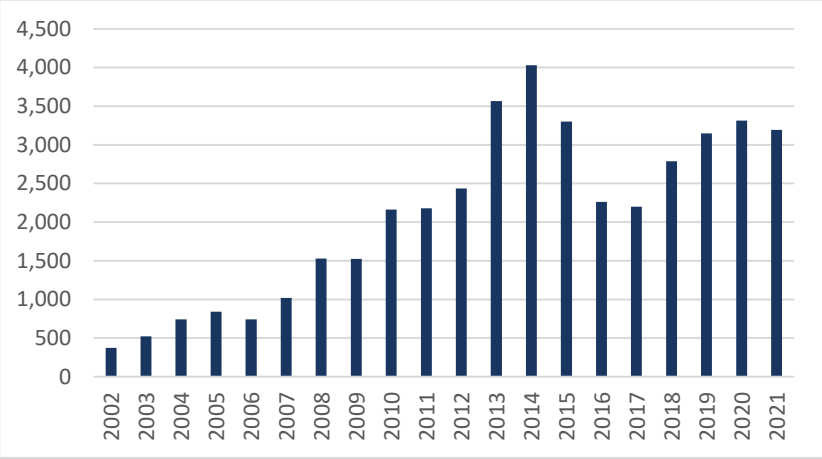
10.2 Brief world overview of global sesame trade and production

Figure 64 Leading world producers of sesame seed, 2018 (MT)



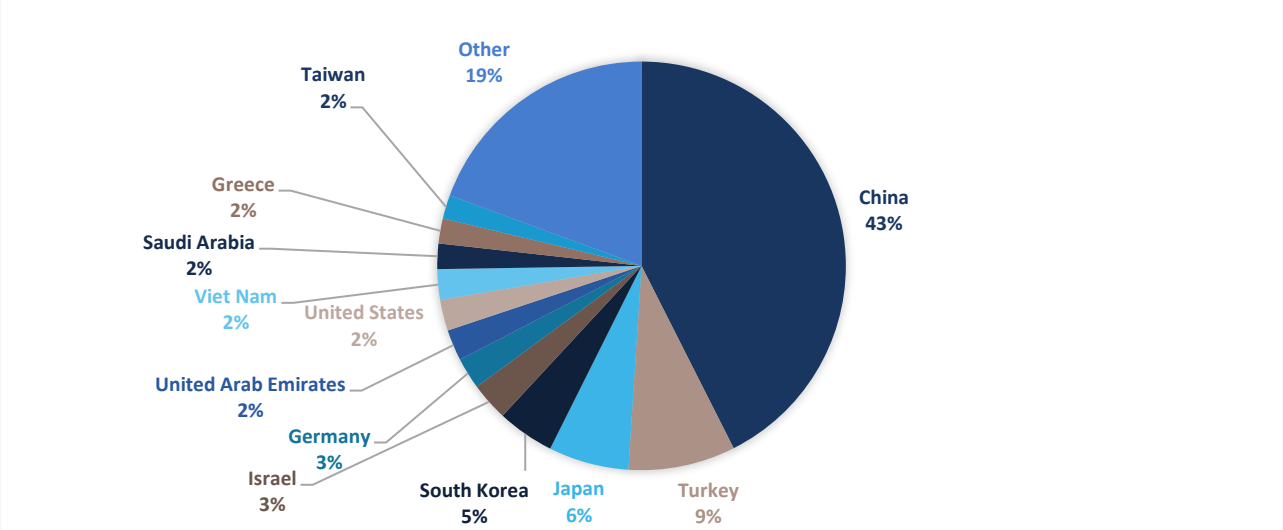
Source: FAOSTAT

Figure 65 Global exports of sesame seed (US$)



Source: Trade Map

Figure 66 Main markets in the world for sesame seed (2021 imports) (% value)



Source: Trade Map

China is the world's largest importer of sesame and is also an exporter. This is because China needs to import oil-grade sesame, while it exports food-grade sesame, mainly to South Korea.

Japan is the world's third largest sesame importer. Sesame oil, particularly from roasted seed, is an important component in Japanese cooking – traditionally the principal use of the seed. Japan relies largely on imports.

10.2.1 Global market drivers and market restraints

Increasing demand for sesame seed from the bakery and confectionery industry

The use of seeds, including sesame seeds, in the bakery and confectionery industry, has gained more popularity in recent years. The demand for sesame seeds both for their nutritional as well as sensual characteristics (taste, texture and visual effect) is rising exponentially in several on-the-go bakery products such as bread, cakes, pastries and buns. Bakeries mainly demand hulled white seeds but can also use black seeds for a nutty flavour, crunchiness and colour contrast.

An important element of this bakery market drive is the massive rise in fast-food outlets in Asia, primarily in China and India where the sheer size of middle-class consumption has created a substantial volume of sesame sales, albeit only to sprinkle on a burger bun.

The biggest client in the world is McDonald's who use white sesame seeds on their signature bun. Most of these are supplied from Mexico (McDonald's buys 80 per cent of Mexico's production). In medium- to smaller-size markets, McDonald's sources centrally – in the case of sesame, from Mexico. In bigger markets like China and India, sourcing is conducted locally.

Increasing use of more efficient seed processing equipment

The sesame processing industry is concentrated in India and China. The processing involves: cleaning – impurity, dust and stone removal; sorting; and hulling. Improved efficiency in both cleaning and hulling machinery along with reduced water use is changing the rate of processing significantly.

Strong international competition. African sesame seeds are sold at a slightly lower price than those from other regions, thereby posing stiff competition.

Fluctuations in the prices of sesame seeds have had a great impact on the sesame seed market. The global production of sesame seeds is controlled mainly by India, China and Africa. The pricing trends for different types of sesame seeds show similar developments, as well as specifying the inter-dependence for pricing between the numerous global suppliers. Globally, sesame seeds have an annual price volatility of ~25–30 per cent. The price deflections are mainly due to supply issues rather than crop failures.

Salmonella risk in sesame seeds. A report mentions that there were 193 notifications on the European Commission's Rapid Alert System for Food and Feed (RASFF) in respect of the *Salmonella* spp. bacteria in sesame seeds and sesame seed products from January 2007 – May 2016. In fact, this continues today. Contamination cases still occur and greatly affect the image of supplying countries. In the first quarter of 2020 there were also 22 border rejections of sesame seeds reported by RASFF due to salmonella. The issue is not only a European occurrence, but it is also worldwide and a major issue for the sector.

10.3 Sesame – Europe

10.3.1 European market opportunities and insights for sesame seeds

Sesame seed is 2nd on the list of imported oilseeds in Europe with imports of US$370m in 2021. In order of magnitude the market is quite a bit smaller than those of China or Japan, the key difference being the importance in China/Japan of sesame for sesame oil production, while in Europe the key application is in the bakery sector and for other foods like humus.

The consumption of sesame seed in Europe can be divided into three categories:

- The food application industry
- The cosmetics industry
- The pharmaceutical industry.

Although the array of cosmetic and pharmaceutical products that find value in incorporating healthy ingredients like sesame seeds continues to grow in Europe, the food industry remains the largest consumer.

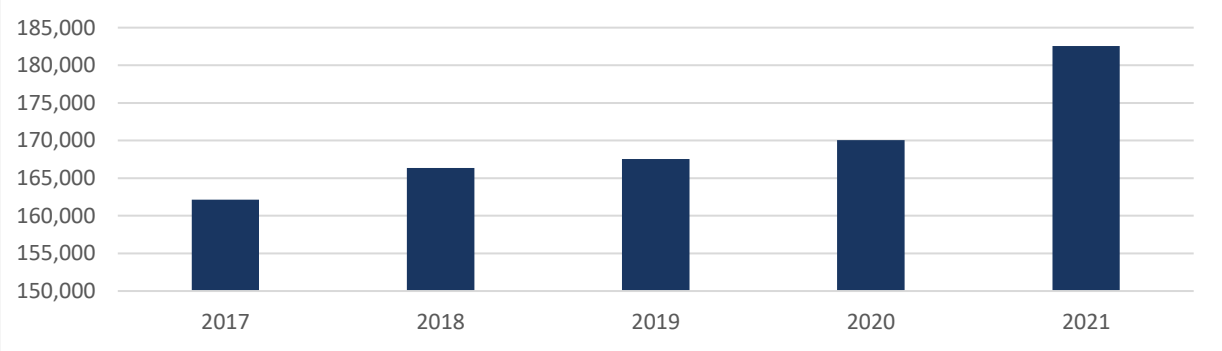
Table 86 Leading European (EU+UK) oilseed imports

Oilseed type	Import 2021 US$ m
Other oilseeds	535.2
Sesamum seeds	370.28
Mustard seeds	161.8
Poppy seeds	105.5
Melon seeds	103.59
Cotton seeds	56.9
Safflower seeds	21.2
Palm nuts and kernels	4.3
Castor seeds	0.07

Source: Trade Map

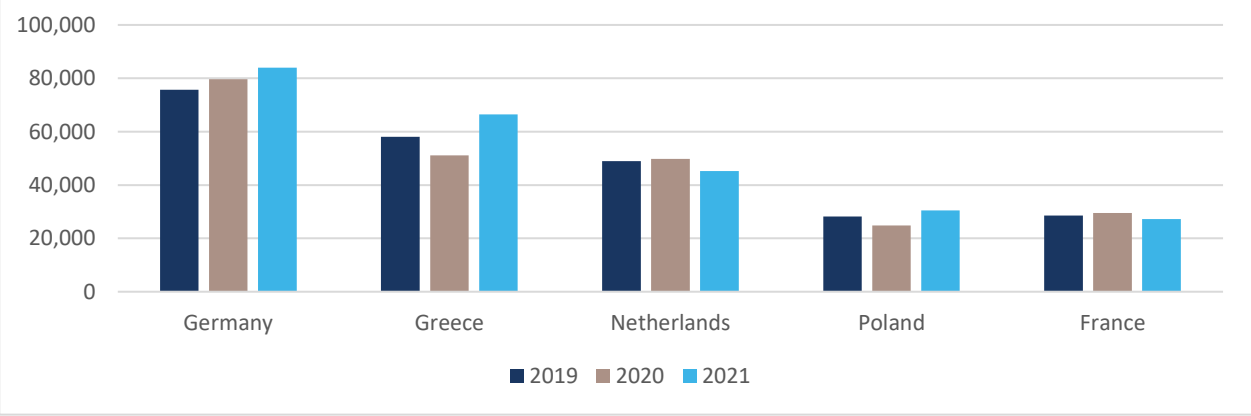
As Figure 67 below shows, European imports have experienced strong growth since 2017, in line with the overall global growth in demand for sesame. Fortune Business Insights valued the European sesame seeds market at US$445.9 million in 2018 and predicts that the market will reach US$638 million by the end of 2026, thereby exhibiting a CAGR of 4.73 per cent.

Figure 67 European (EU+UK) imports of sesamum seeds, 2017–21, tons



Source: Trade Map

Figure 68 Leading European (EU+UK) importers of sesamum seeds (US$'000)



Source: Trade Map

Germany, Greece and the Netherlands are the key markets within Europe. In Germany, sesame seeds are used in many different bread types or as toppings on several snacks (such as pretzels) and pastries. Germany has large bakery and confectionery sectors accounting for around 20 per cent of that country's total food and beverage industry production. The country is also an important trade hub for sesame seeds in Europe, second only to the Netherlands. The size of the ethnic Turkish community in Germany should also not be overlooked. Sesame seeds are an important ingredient for Turkish bread, desserts and confectionery.

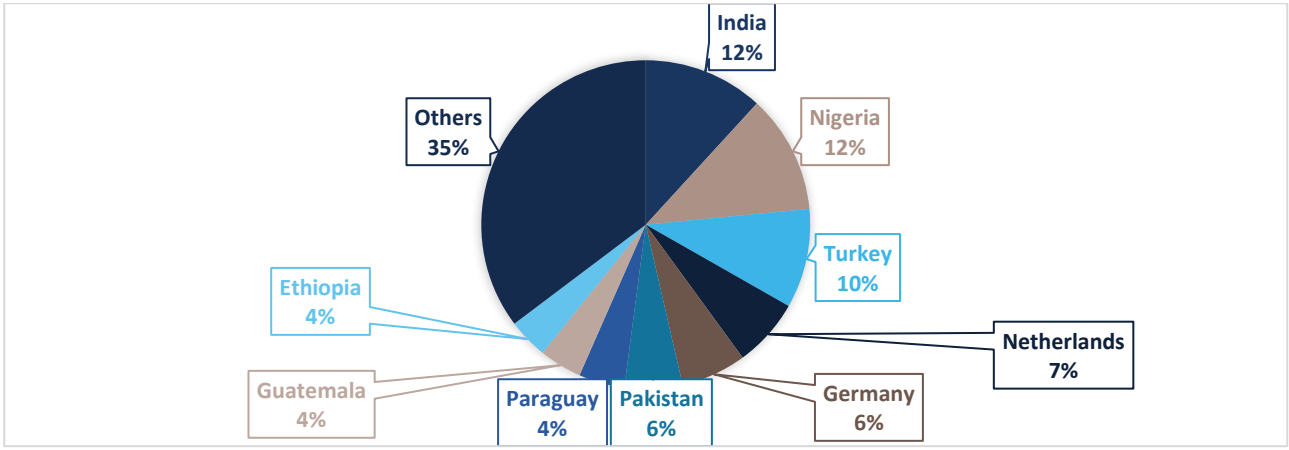
In addition, sesame seeds are a popular ingredient in traditional Greek cuisine; they are used in spreads such as tahini and halva as well as in bakery and confectionery products. Although Greece does produce some sesame of its own, it largely depends on imports.

Although some of these imports are processed by Dutch food manufacturers – and the Dutch definitely also like their bread, often with a good sprinkling of sesame on it – a significant share is re-distributed to other European countries. In 2021, Dutch exports of sesame seeds amounted to 17,218 MT. The port of Rotterdam is used by a number of large ingredient importers, including Olam (for whom sesame is an important product) and Dipasa (who specialise in sesame).

Poland and France are smaller but also significant markets in Europe. The growth in imports, signifying strong demand in the period 2017–21, can be witnessed across Germany and Greece.

India, Nigeria and Turkey are main suppliers. Being a large-scale producer and efficient large-scale processor of white sesame (and able to supply organic sesame in sizeable volumes) makes India an especially attractive destination for trading companies sourcing for the European market. However, there have been concerns about food safety issues and, according to CBI, Netherlands, sesame from India is subject to stricter controls before entering the European market.

Figure 69 Leading suppliers of sesame seeds to Europe, 2018 (US$ m)



Source: Trade Map

10.3.2 Key European sesame market trends

Non-traditional foods – particularly products like humus and tahini – have been mainstreamed (see Mintel's article on the rapid mainstreaming of humus on the German market for example). But other non-traditional foods, such as Chinese and Japanese cuisine, [40] have also gained in popularity.

In Europe, sesame seeds are increasingly used in vegan, vegetarian and cuisine dishes. This is one of the biggest and most important trends behind the increased rate of sesame consumption in Europe.

Image source: https://www.mygreekdish.com/

[40] **https://www.mintel.com/blog/food-market-news/the-3-reasons-hummus-is-becoming-more-mainstream-in-germany**

More niche segments are on the rise, such as black sesame ice cream and Korean food.

Over the last decade, the call for natural and clean-label ingredients has become ever stronger. Changing consumer consumption patterns and increasing health awareness are driving consumer appreciation for sesame seeds, which have become 'trendy' in new product launches. As reported by Food Innovation Solutions, this is a growing market with room for innovation, often including raw foods with a low fat, low sugar and high protein content. For example, cereal bars like sesame honey energy bars (for example, Sunita Fine Foods) are in heavy demand. Innovations like ready-to-use (organic) tahini, snack options with black sesame and sesame milk also boost the market and combine convenience with non-traditional food.

Organic sesame is still a niche market in Europe. But in certain countries, bakery is becoming increasingly organic and therein lies an opportunity for sales of organic sesame to grow.

10.3.3 Standards

Buyer requirements – quality

For buyers, some of the most important quality assessment factors relating to sesame seeds are colour, odour, flavour, oil content, moisture content, size, uniformity of seeds, purity, and the absence of damaged/mouldy seeds. Sesame seeds should also be free from mycotoxins and harmful microbiological activity, and buyers closely monitor these aspects. The minimum quality requirements for sesame seeds will depend greatly on the end-product the seed will be used for. For example, tahini needs a sweet taste and aroma, and sesame seeds from some origins are not suitable for this. For bakery purposes, very high purity levels are required, and some suppliers might not be able to reach these levels. In sesame oil, clarity is important, and also requires sesame seeds with the appropriate characteristics.

Buyer requirements – food safety

In addition to the requirements to gain legal access to EU member markets (covered in Annex I), which are essentially about control against contaminants like salmonella, aflatoxins and excessive pesticide residues, European buyers will also have their own food safety and quality requirements. Buyers commonly require their suppliers to have a certified quality/food safety management system in place to demonstrate the suppliers' ability to control food safety hazards to ensure that food is safe at the time of consumption. HACCP (Hazard Analysis and Critical Control Points) certification is a good starting point. However, to supply directly to food manufacturers in Europe it is necessary to have a certified, recognised food safety management system such as ISO22000, British Retail Consortium (BRC) or International Featured Standards (IFS): Food.

Buyer requirements – social responsibility

Corporate social responsibility and sustainability are growing in importance in the oilseeds sector. Adopting codes of conduct or sustainability policies related to the environmental and social impacts of a company, can provide a competitive advantage.

10.3.4 Prices and tariff advantages

Table 147 German CIF prices – sesame seeds (US$/kg)

	2019	2020	2021
Nigeria	1.98	1.93	1.93
India	2.14	1.92	1.94
Guatemala	2.57	2.32	2.04
Uganda	2.19	2.24	2.26
Paraguay	2.09	1.84	1.88

Netherlands	2.19	2.24	2.36
Egypt	2.48	2.62	2.38

Source: Trade Map

Table 88 Sesame – tariff advantages in Europe

Code	Tariff	Regime	Exporting Country
12074090	**0.0%**	**MFN**	**All supply countries**

Source: Market Access Map

The EU market has a fully open policy for the supply of sesame seeds – no tariffs or quotas. There is, therefore, free access, but no specific market access advantage for Cambodian supplies of sesame seeds compared with those of competitor countries.

10.3.5 Trade fairs, traders and importers

- Food Ingredients Europe
- Biofach
- SIAL
- ANUGA

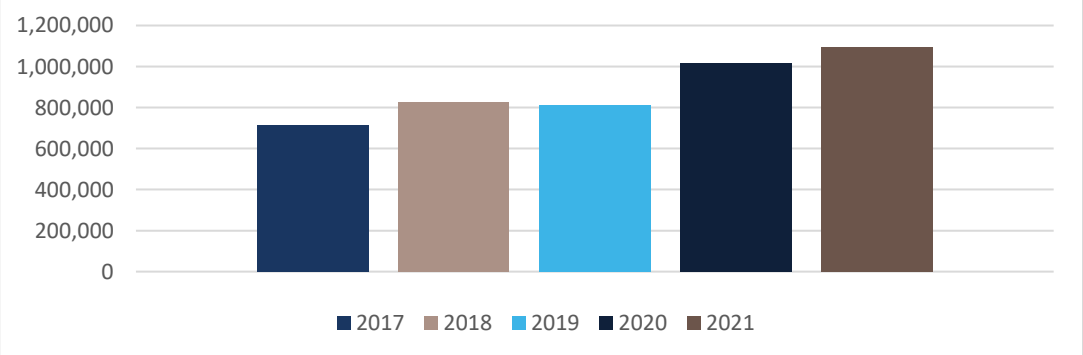
Table 89 Traders and importers

Trader	Website
Olam	**www.olamgroup.com/products/edible-nuts/sesame**
Schlüter & Maack GmbH	**www.schlueter-maack.de/en**
H.A. & Gustav Küchler (Amsterdam Commodities NV)	**www.kuechler.com**
Tampico Trading GmbH	**www.tampico.de/en**
JANNIS S.A.	**www.jannis.gr**
JKT Foods Europe BV	**www.jktfoods.com**
Haitoglou Bros S.A.	**www.haitogloubros.com**
Van der Does Spice Brokers	**http://doesspice.com/**

10.4 Sesame – China

10.4.1 Chinese market opportunities and insights for sesame seed

Figure 70 Chinese imports of sesame seeds, 2017-2021 (tons)



Source: Trade Map

Table 90 Chinese oilseed imports, 2021

Chinese oilseed imports 2021	US$ m
Sesame seeds	1429.698
Cotton seeds	46.518
Other seeds	23.451
Castor oil seeds	14.509
Safflower oil seeds	12.414
Melon seeds	5.997
Mustard seeds	0.832
Palm nuts and kernels	0.185

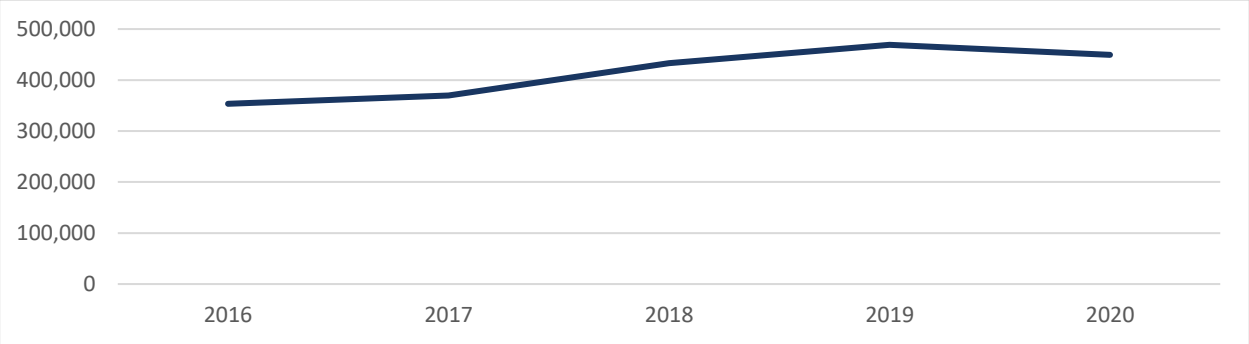
Source: Trade Map

Figure 70 above shows the enormity of Chinese sesame imports, expanding from 400,000 MT in 2012 to over a million tons in 2021. Sesame seed is an important oilseed for China, the second most imported seed after rape seed. Sesame seed imports represent 30 per cent of all Chinese oilseed imports. Oilseeds in this context do not include other cooking oil products like soya bean oil, palm oil and peanut oil.

In a reverse picture of the import ascension, Chinese seed production has been reduced over the years, sliding from 630,000 MT in 2014 to a trough at 352,000 MT in 2016, but now climbing up again slightly to around 440,000 MT. The slide in production can largely be attributed to farmers shifting from sesame cultivation to other more profitable produce. At the same time, imports surged, not only to meet demand as a consequence of reduced production, but also to meet demand triggered by the healthy growth rate in the bakery and the confectionery industries. Added to this is the adoption of cosmopolitan food habits and changing lifestyles – a trend that has increased the demand for ready-to-eat food products – and the strong growth in the cosmetics sector.

Chinese consumption – and consequently also imports – of sesame seed is expected to continue to expand. Insight Partners valued sesame seed market revenue in China at US$4,431.2 million in 2018 and it is projected to reach US$5,823.4 million by 2027; it is expected to grow at a CAGR of 3.1 per cent during the forecast period.[41]

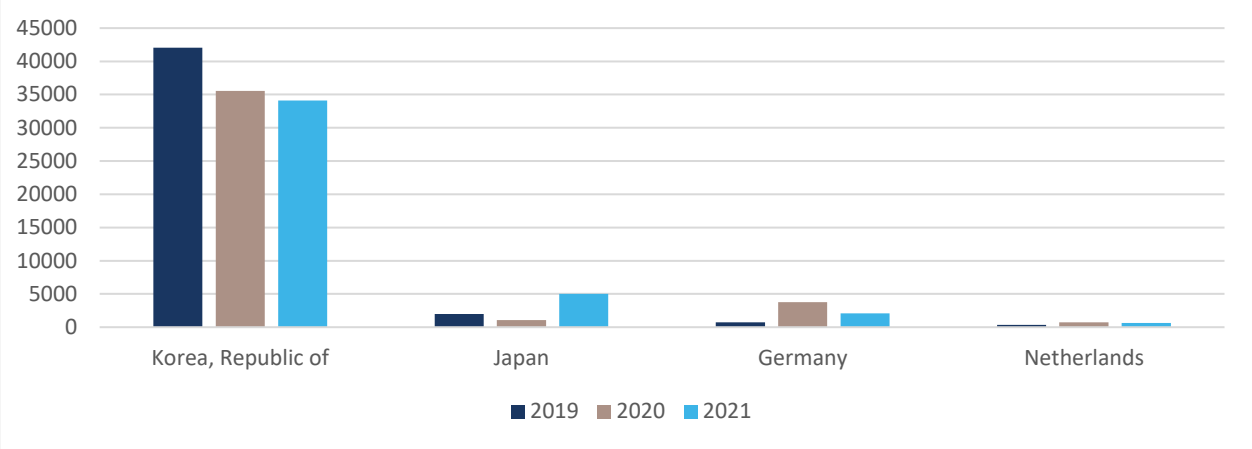
Figure 71 Chinese sesame seeds production, 2016–20 (tons)



Source: FAOSTAT

41 **Insights Partners include in their projection sesame oil, sesame cake, sesame powder and value additions**

Figure 8 Main destinations of Chinese sesame seed exports, 2019–2021 (tons)



Source: Trade Map

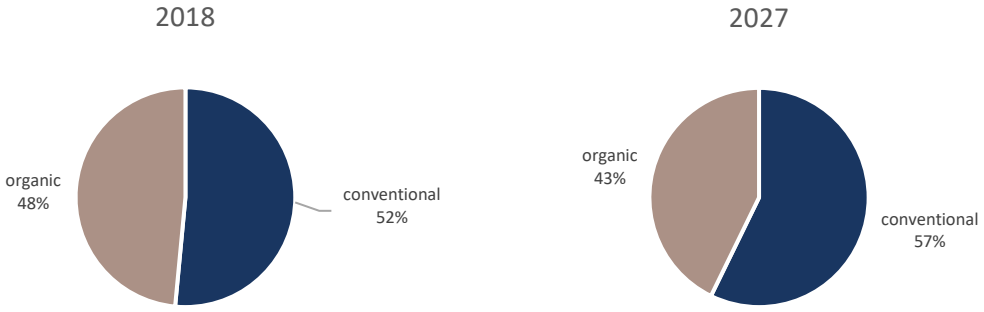
As mentioned previously, China also exports sesame seeds globally: importing oil-grade sesame, while it exports food-grade sesame, mainly to South Korea. In 2021, China exported US$87.5 million worth of sesame seed, virtually all of it to South Korea.

While China's own production is traditionally black sesame, the landscape has changed significantly. Insight Partners dissects China's sesame market into 57 per cent white, 32 per cent brown and 11 per cent black. The black sesame seeds are used to flavour cakes, pastries, cookies, and popular desserts such as sesame seed balls and fried custard.

White sesame seeds present a nutty flavour and are commonly toasted before being used in food products. Sesame paste, which is made by pulverising toasted sesame seeds, is an ingredient in noodle dishes that include a thick, nutty sauce.

Insight Partners also claim that organic sesame has already reached 42 per cent of total Chinese sesame revenue[42] (note: this covers sesame oil, oil cake, food products, cosmetics, and so on) and they forecast that 'organic' as a proportion of revenue will continue to grow more quickly than conventional varieties – at a rate of 4.5 per cent compared with 1.9 per cent – reaching 48.5 per cent in 2027.

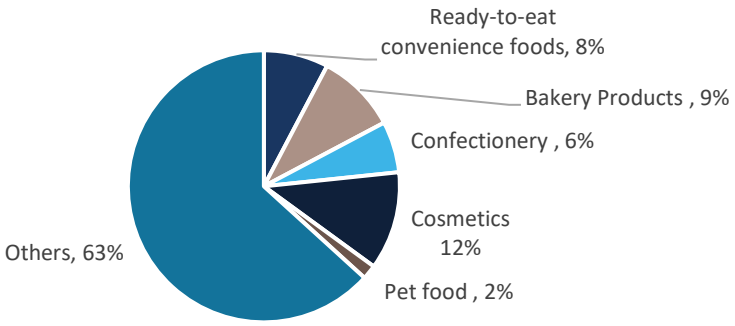
Figure 73 Chinese sesame seed market – conventional compared with organic (by revenue)



Source: Insight Partners

42 **The author of this CAVAC report does question on what basis this amount of 'organic' is certified. Nevertheless, the main reading is that demand for organic is strong. Multiple opinion leaders also refer to the 'soaring demand for organic sesame'.**

Figure 74 Chinese sesame seed market – by application (by revenue)



Source: Insight Partners

The growth of the sesame seed market in the country is primarily attributed to the increasing demand from food processing companies. The manufacturers of convenience food products are introducing new snacks and bars made from sesame, which further supports the market growth in China.

10.4.2 Standards

China adheres to national standard GB/T 11761-2006[43] which can be downloaded for a fee from various translation service providers. As sesame oil production is a fundamental element of the Chinese sesame landscape, seed oil content is a key aspect of quality sought in imported sesame seeds. The standard, therefore, also includes details specifically for 'oil-making sesame' – a grading in respect of the primary basis of oil content ranging from grade 1: =>51 per cent to grade 5: =>47 per cent. Other elements of quality include moisture content, mass of grains, impurities, percentage of proteins, colour and odour. Additional aspects looked at by the standard include:

- whether the seed is intact
- whether the sample includes unripe, worm-eaten or damaged grain
- the health elements relating to microbial content.

With respect to organic produce, China has national regulations governing organic production, processing, labelling and management systems. A standard that has very recently been updated is GB/T 19630-2019 (read more in Annex I on Chinese Legal Market Requirements).[44]

10.4.3 Prices

Table 91 Chinese CIF prices of sesame seed (US$/kg)

	2019	2020	2021
World	1.48	1.25	1.30
Niger	1.42	1.24	1.22
Togo	1.48	1.28	1.32
Sudan	1.49	1.28	1.28

43 http://www.gbstandards.org/GB_standard_english.asp?code=GB/T%2011761-2006&word=Sesame%20seed

44 The guide provided in the Annex of http://www.sesameinformation.com/pdf/Indian_Sesame_Scenario.pdf also gives a useful insight into quality aspects and grading, albeit in the Indian scenario, but relevant, as India is a leading supplier globally.

Ethiopia	1.59	1.43	1.49
Tanzania	1.51	1.10	1.30
Pakistan	1.39	1.19	1.27
Mozambique	1.43	1.08	1.32
Myanmar	1.37	1.96	1.30

Source: Trade Map

10.4.4 Relevant Chinese trade fairs and prospective importers

- IFE China
- SIAL China
- FBIE Shanghai
- ANUFOOD China
- FHC China

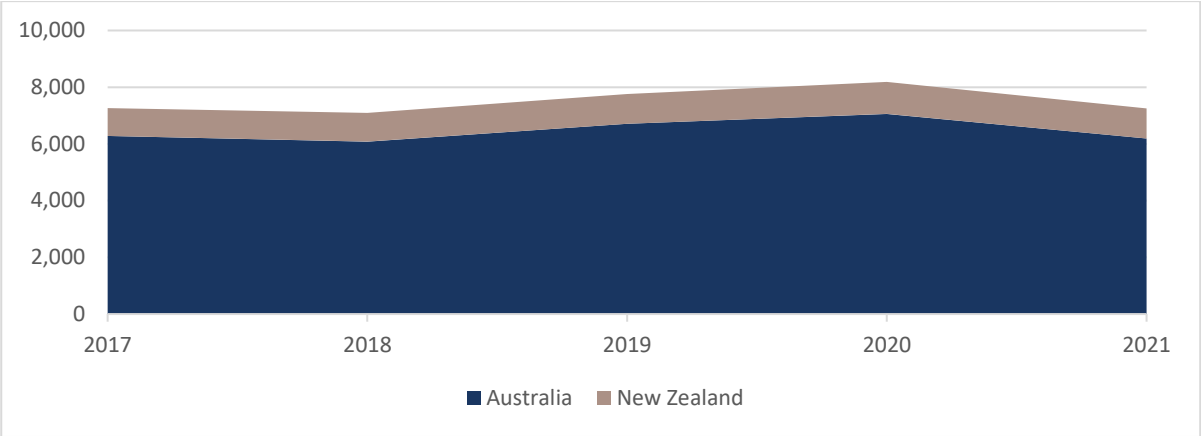
Table 92 Prospective importers

Company	Website
Shijiazhuang Mingren Sesame Co., Ltd	**http://www.sjzmrzm.com/English**
Chengdu Hangrong Food Co.,Ltd	**https://www.listofcompaniesin.com/Chengdu_Hangrong_Food_Co_Ltd_Company_2773723.html**
Hebei Xinli Grain & Oil Co., Ltd	**https://owenhao.en.made-in-china.com/**
Hefei Yanzhuang Edible Oil Co Ltd	**https://www.linkedin.com/company/yzoils**
Qingdao Bolan Group Co., Ltd	**http://en.bolan.com.cn**
Anhui Longxi Foreign Trade Sesame Oil Manufacturing Co., Ltd.	**https://panjiva.com/Anhui-Longxi-Foreign-Trade-Sesame-Oil-Mfg-Co-Ltd/30370655**
Wuhan Fuda Edible Oil Seasoning Co.,Ltd	**https://panjiva.com/Wuhan-Fuda-Edible-Oil-Seasoning-Co-Ltd/37375353**
Weifang Ruifu Oil & Condiment Co Ltd	**https://panjiva.com/Weifang-Ruifu-Oil-Condiment-Co-Ltd/26603478**
Tongchuang Xin Yi (Tianjin) Of Grain and Oil Co., Ltd.	**https://panjiva.com/Tongchuang-Xin-Yi-Tianjin-Of-Grain-And-Oil-Co-Ltd/30789851**

10.5 Sesame – Australia/New Zealand

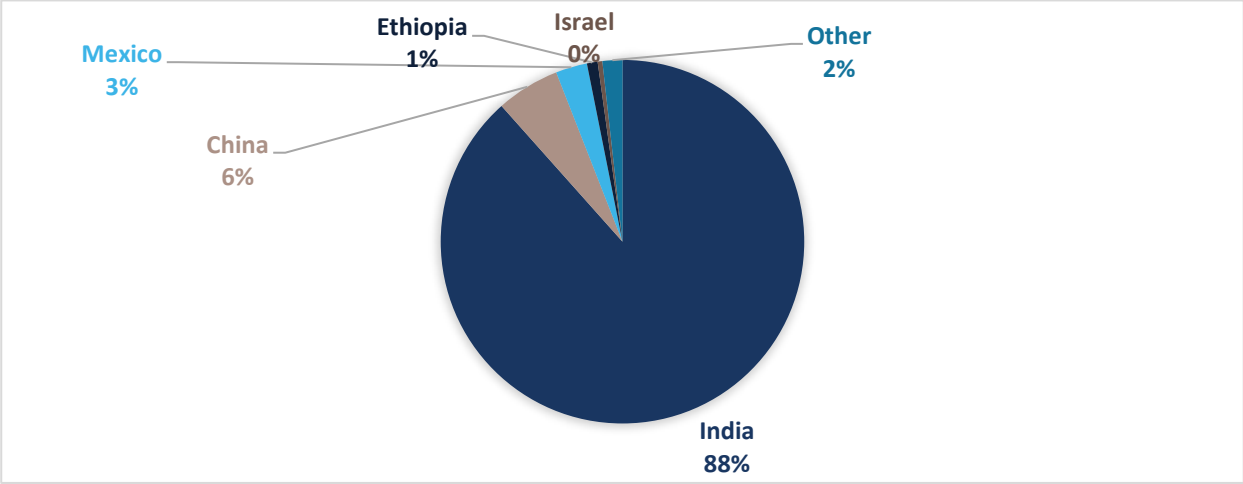
10.5.1 Australian/NZ market opportunities and insights for sesame seed

Figure 95 Australian and New Zealand imports of sesame seeds, 2017-2021 (tons)



Source: Trade Map

Figure 76 Leading suppliers of sesame seeds to Australia (US$ m)



Source: Trade Map

Although the majority of Australians are of British and Irish origin, 3.7 per cent are of German origin, 3.6 per cent are of Chinese origin, and 1.6 per cent are of Greek origin. The largest Greek population outside of Greece lives in Melbourne. This constitutes an adequate mix for cuisines favouring sesame as an ingredient. The 3.7 per cent of Australians that are of German origin are particularly influencing the use of sesame in bakery.

In fact, Australia is itself on the verge of producing sesame commercially. Australian farmers have teamed up with university researchers, specialised seed and seed technology companies such as Equinom (Israel) and AgriVentis Technologies (Australia), and the local council to grow the first Australian commercial crop of a black sesame seed. The ongoing research and initiatives supported by the government are expected to propel the growth of the sesame seed market in Australia.[45]

The current production of sesame in Australia is not listed in FAO data. However, it is estimated that approximately 525ha is currently being used to produce both white and black sesame in Australia (Bhattarai, 2019). Besides sesame seed, sesame oil production in Australia is also very limited (i.e., largely all imported) the main companies making sesame oil are Proteco Oils and Perfectly Pressed – neither currently producing 'cold-pressed' on a large scale.

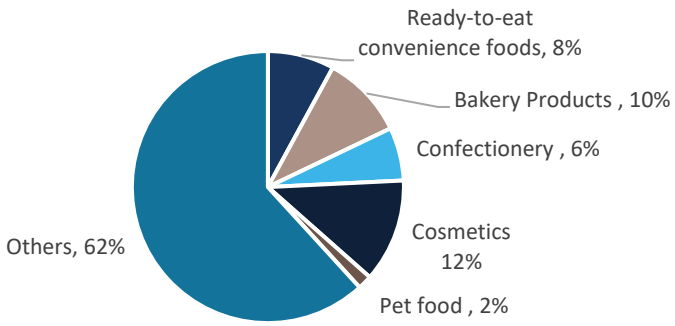
45 **More information about Australian black sesame production can be found at: https://www.abc.net.au/news/2018-08-12/black-sesame-seed-crop-proves-drought-resistant-rockhampton/10004376.**

India is a leading supplier to both Australia and New Zealand, supplying four-fifths of Australia's sesame seed imports. Mexico's 5 per cent market share (also in New Zealand) is very likely to supply McDonald's.

Trends in the Australia/New Zealand sesame markets are similar to those in Europe:

- There is the mainstreaming of non-traditional foods – particularly products like humus and tahini but also Chinese and Japanese cuisine – and the use of sesame in many culinary gourmet presentations.
- In Europe, sesame seeds are increasingly used in vegan, vegetarian and cuisine dishes. This is one of the biggest and most important trends behind the increase in sesame consumption in Europe.
- Over the last decade the call for natural and clean-label ingredients has been ever stronger. Changing consumer consumption patterns and increasing health awareness are driving consumer appreciation of sesame seeds.
- Besides bakery, confectionery and ready-to eat foods, the cosmetics industry in Australia/New Zealand also uses sesame seeds. They appear in, for instance, moisturisers, lipsticks and other make-up products, sunscreen products, skin cleansers, and hair products. Sesame seed oil is also used for producing soaps. The demand for natural and chemical-free ingredients has surged in the personal care industry throughout the world – including in Australia and New Zealand. It should be noted that, for this purpose, oil is imported as an ingredient. This means that the cosmetics are not manufactured in Australia/NZ from seed but from imported oil, unless in rare super-premium cases where the product is exclusively described as e.g., 'cold-pressed'. Australia imported US$M 11, amounting to 2,628 MT of sesame oil in 2021. Cosmetics account for up to 12 per cent of Australia's total sesame revenue against 10 and 8 per cent for bakery and convenience foods, respectively.

Figure 77 Australian sesame seed market – by application (based on revenue)



Source: Insight Partners

Quality requirements for sesame seeds in Australia and New Zealand are similar to those in Europe – purity, colour, etc. - specific per industry. Salmonella is an equally major concern.[46]

10.5.2 Prices

Table 93 Australian and New Zealand average CIF prices – sesame seed (US$/kg)

Australia	2019	2020	2021
India	**2.15**	**1.85**	**1.79**
China	**2.12**	**2.11**	**2.24**
Ethiopia	**2.17**	**2.69**	**2.95**
Mexico	**2.69**	**2.84**	**2.67**
New Zealand	**2019**	**2020**	**2021**

46 https://www.foodstandards.gov.au/consumer/importedfoods/Documents/Sesame%20seeds%20and%20Salmonella.pdf

India	**2.24**	**1.97**	**1.98**
China	**2.58**	**2.86**	**2.73`**
Japan	**3.50**	**3.75**	**3.11**

Source: Trade Map

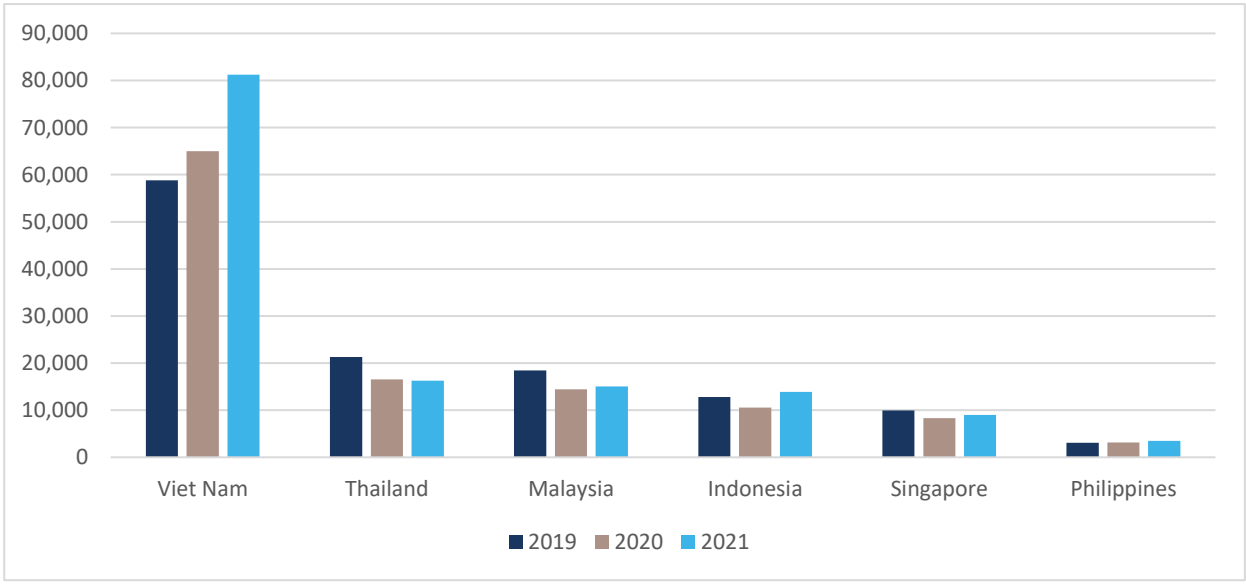
10.5.3 Prospective importers

Table 94 Prospective importers

Company	Website
The Source Bulk Foods	**https://thesourcebulkfoods.com.au**
Terra Madre	**https://www.terramadre.com.au/wholesale**
NSM	**https://nsm.com.au**
Kanegrade	**http://www.kanegrade.com**
Priority Health	**https://www.priorityhealth.com.au**
Scalzo Trading Co.	**https://www.scalzofoods.com.au**
Trutaste	**www.trutaste.com.au**
Davis Food Ingredients	**https://davis.nz**
Mother Earth	**www.motherearth.co.nz**

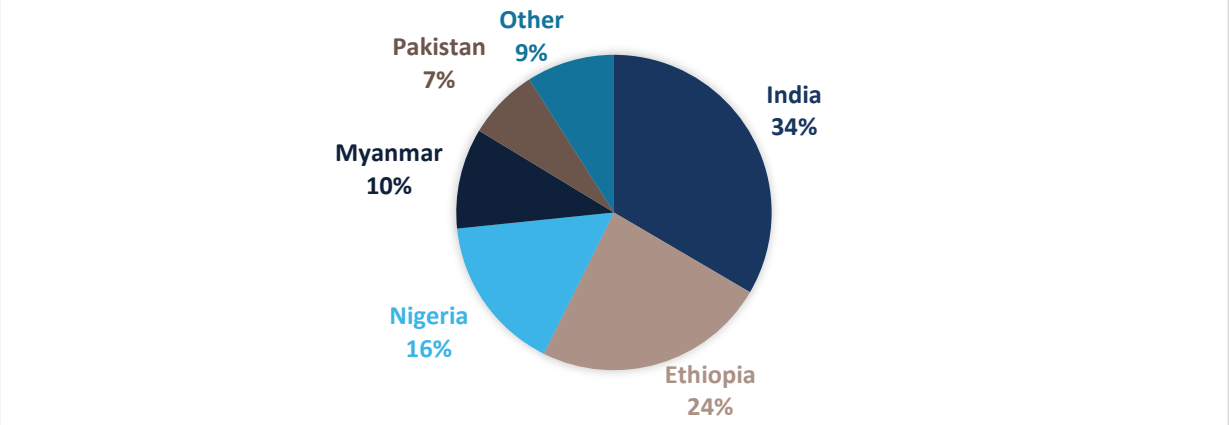
10.6 Sesame – ASEAN

Figure 78 Leading ASEAN importers of sesame seeds (US$'000)



Source: Trade Map

Figure 10 Leading suppliers of sesame seeds to ASEAN countries (US$ m)



Source: Trade Map

Sesame seeds are imported in the leading ASEAN countries – Vietnam, Thailand and Malaysia – primarily for their own fast-growing sesame oil production industry (the fastest is in Vietnam) for domestic consumption. However, all the applications of sesame seed – in confectionery, baked snacks, cosmetics, ready-to-eat food products, pet food, bakery products and sesame oil – are thriving in the three Asian Tiger economies, Thailand, Vietnam and Malaysia. Within the ready-to-eat sector, the thriving restaurant business can be included, and this involves many Japanese, Chinese and Korean restaurants targeting upper- and middle-class customers.

The cosmetics industry is especially vibrant in Thailand – which is a growing end-market segment for its sesame oil.

Vietnam is also an exporter of sesame oil, mainly to Japan. Within ASEAN, Singapore, however, is the main exporter of sesame oil, led by Oh Aik Guan Food Industries Pte. Ltd. and Chee Seng Oil Factory Pte. Ltd.

Table 95 Exports of sesame oil, 2021, leading ASEAN exporters

Location	Export (US$'000)	Main destination
Singapore	**19,580**	**AUS, IDN, NLD**
Vietnam	**5,922**	**JPN, KOR**
Malaysia	**5,225**	**SNG, PHL, IDN**

Source: Trade Map

10.7 Sesame – Japan

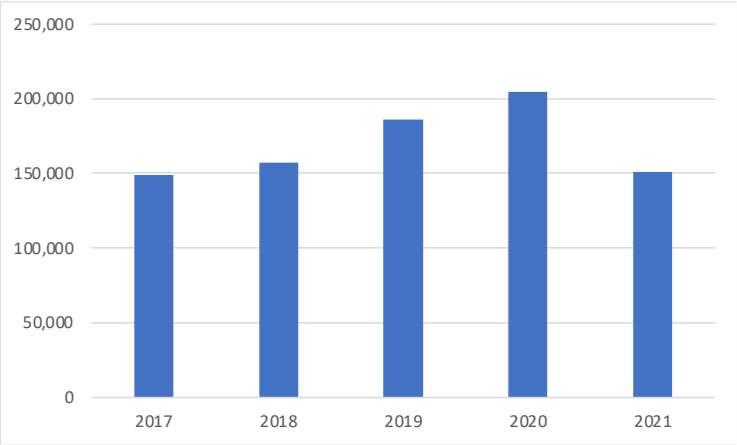
10.7.1 Japanese market opportunities and insights for sesame seeds

Japan is the third largest market for sesame seed worldwide importing over 200,000 tons in 2020 but dropping back down to 150,000 tons in 2021. Roasted sesame seed oil is an important component of Japanese cooking and it is estimated that some 70 per cent of Japan's imports are used for this purpose. But sesame configures in many other aspects of Japanese cuisine either as a powder, a paste, a roasted condiment or whole. Increasing consumer concern for healthy eating, and the beneficial image of sesame in this regard, has led to continued expansion of Japanese consumption over the years. At the same time, Japan's sesame oil industry for export is also a driver of continued import expansion. Japan is the world's largest exporter of sesame seed oil, exporting some US$70 million annually with a 20 per cent global market share. Half of Japan's sesame seed oil exports are destined for the United States.

Common practice in Japanese cuisine is to crush roasted sesame for salad dishes and to sprinkle sesame over foods like sushi.

The significant drop in imports from 2020 to 2021 was caused in major part by the disruptions to trade caused by the COVID pandemic. It also coincided with two military coups that year in supply countries – Burkina Faso and Myanmar.

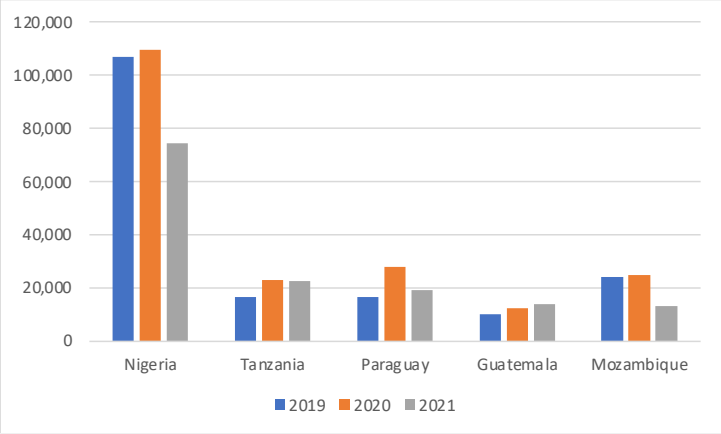
Figure 80 Japanese imports of sesame seeds (MT)



Source: Trade Map

Japan's sesame seeds are mainly sourced from Africa. Nigeria is Japan's leading supplier with a 35 per cent market share. Tanzania and Mozambique are also major suppliers along with Guatemala and Mozambique.

Figure 81 Japanese imports of sesame – main supply sources ($'000)



Source: Trade Map

10.7.2 Trends

Rising consumer inclination towards healthy-living and adopting healthy food ingredients, is an important driver for continued rising consumption of sesame in Japan. In recent years, Japanese consumers have become more health-conscious and have become better educated about the nutritional benefits of both almonds and walnuts. Strategic marketing and promotion of the health and beauty benefits by major television stations as well as on internet and social media sites, have continued to be effective. Health-related messaging includes key words like omega-3, antioxidant, vitamin E, vitamin B, minerals, oleic acid, anti-ageing, cholesterol reducing, zero cholesterol, healthy blood vessels, healthy brain, healthy skin, etc. This type of messaging has been key to promoting nuts and nut products to Japanese consumers.

Although demand for **organic food** is relatively small in Japan, consumer interest is slowly growing and there could be vast opportunities for suppliers provided that they can meet Japan's stringent standards. (www.food-navigator-asia.com)

10.7.3 Price and Tariff advantages

Table 96 Average CIF import prices in Japan for sesame seed, US$/kg

	2019 US$/Kg	2020 US$/Kg	2021 US$/Kg
Nigeria	1.45	1.43	1.26
Tanzania	1.59	1.25	1.30
Paraguay	2.09	1.86	1.70
Guatemala	2.33	2.05	1.64
Mozambique	1.58	1.59	1.29

Source: Trade Map

Sesame is largely a commodity with less variation in prices apart from shipping distance influencing CIF costs. A progressive decline can be seen over 2019 and through 2021 across the board.

Japan applies 0 per cent duty on imports of sesame seeds from all countries, hence there is no tariff advantage for Cambodia over competing suppliers to the Japanese market.

10.7.4 Trade Fairs

- FOODEX Japan 2023, March 7-10, 2023, Tokyo Big Sight, Tokyo
- FABEX Kansai 2022, September 7-9 2022, Intex Osaka, Osaka
- FABEX Kansai is for the food market in Kansai area and west of Japan
- Supermarket Trade Show 2023, February 15-17, 2023, Makuhari Messe, Chiba

10.7.5 Importers

Table 97 Prospective Japanese sesame seed importers

Royal of Japan	www.royalofjapan.co.jp
Kadoya Sesame Mills	https://www.kadoya.com
Iwai Sesame Oil Co., Ltd.	https://www.iwainogomaabura.co.jp/
Japan Oilseed Processors Association – member list	https://www.oil.or.jp/en/kyoukai/ichiran.html

11 Recommendations for Policy Interventions

11.1 Study scope limitations

Before recommending any policy interventions, it is important re-iterate the scope of this study, as was mentioned in Chapter 1. Following a demand-driven approach, the study emphasises the demand picture that will shape a direction for sub-sectors to pursue. It is, however, too early, or is outside of the scope of the study, to give detailed recommendations about what strategic steps the sub-sectors should take to respond to increased knowledge about the demand picture in order to enhance their competitiveness. For that, more detailed work on the supply side is required after this study.

Nevertheless, some broader policy recommendations can be made based on the findings of the study. Some of these have already been made in the Chapters covering the respective crops. This short Chapter serves to synthesise those recommendations and to go into more detail.

11.2 Perspectives

Before making policy recommendations, it is important to provide more of an overview of the range of crops being studied. For policymakers it is important to know if a crop is 'niche' or 'mass' as this has a big influence on the size of the audience policy interventions could impact. It is also important to have some idea about comparative (dis)advantages compared with competitors in the region. And lastly, it is important to remind ourselves at what stage of development the crops are, taking into consideration, for example, the fact that crops like avocado are not yet at any significant level of production: this crop was selected with a view to the future.

The two Tables below portray the crops against these perspectives to give a 'back-of-mind perspective'.

Table 98 Mainstream compared with Niche

MAINSTREAM (current)	NICHE (current)
Mango – fresh	Mango – organic, premium
Mango – dried	
Cashew – conventional	Cashew – organic
MAINSTREAM (future)	**NICHE (future)**
Avocado – fresh	Mango – purée, conventional, 'fair-trade', organic
Longan – fresh	Mango – frozen, conventional, organic
Longan – dried	White sesame
Sweet potato – traditional variety	Sweet potato – special variety
Chilies – fresh, dried	Chilies – fresh, organic
	Chilies – fresh, special variety
	Palm sugar – organic, GI

The niche compared with mainstream, and the current compared with the future picture, is good for policymakers and donor-support agencies to have at the back of their minds. At the same time, the categories should not entirely be treated as black and white and may at times also complement each other. For example, the best chances for Cambodian mangoes to seize a foothold in the European market would be through first supplying organic as the shortage of supply in the European organic market is much more prevalent. This could be the platform to create interest and desire for Cambodian mangoes, which would then open doors for larger quantities of conventional (mainstream) mango exports.

The 'mainstream (future)' category in the Table above is unique as, for the time being, it is not yet mainstream and the output of crops in this category needs to grow significantly before the widespread impact of policy interventions can be achieved.

Table 99 Comparative position per crop compared with competitors in the region

Crop and processed form	Main competitors	Comparative position
Mango – fresh	**Thailand, Vietnam**	**CMB: cheaper fruit supply** **THA, VNM: GAP and varieties that fit market preference better – e.g., R2E2 for China**
Mango – dried	**Thailand, the Philippines**	**THA: well established, lower energy costs, depends on CMB for RM supply** **PHL: seeking lower priced fruit from CMB**
Mango – purée	**India, Thailand**	**THA: well established, lower energy cost** **IND: global leader, subject to year's mango crop performance, same season as Cambodia**
Mango – frozen	**Vietnam**	**VNM – lower energy cost and cold chain**
Cashew – shelled	**Vietnam**	**VNM: processing efficiency and farmer supply** **CMB: traceability, carbon footprint**
Avocado	**Myanmar**	**Upcoming**
Sweet potato	**Vietnam, Laos**	**VNM: succeeded with Japanese variety and VietGAP certified**
Banana chips	**The Philippines**	**Well established, have RM issues some years**
Longan – fresh	**Thailand**	**Economies of scale**
Longan – dried	**Thailand, Myanmar**	**THA: economies of scale, lower cost of energy** **MYA: exports dwindling, insufficient info. on why**
White Sesame	**Myanmar**	**Economies of scale**
Palm-sugar	**The Philippines, Indonesia coconut sugar**	**PHL: higher yield** **IND: massive scale**
Chilies – fresh	**Vietnam**	**VNM: issues with pesticide residues**
Chilies – dried	**India, China**	**Mega suppliers. India has faced issues with mycotoxins**

11.3 Recommended policy interventions

Based on strategic considerations with respect to the study's findings on the international demand picture and on the competitive landscape, below are a series of recommended interventions grouped under a series of main headings.

Market access

- Gain permission for dried longan exports to China
- Maintain efforts to gain market approval from Japan and Korea for fresh mango and avocado

Actions to support brand image

- Introduce mechanisms for traceability (especially urgent in the case of cashew nuts)
- Strengthen Cambodia's image as the leader in low-chemical crops (an important comparative advantage over competitors in the region)
- Strengthen sustainability by supporting producers and exporters to profile their sustainable practices using platforms like SEDEX. A country/sector-wide approach can also be taken up following best practices like https://www.natureandmore.com/en/growers/nuttapoom-noomhorm and SEDEX
- Show ability to be in control of food safety – e.g., salmonella
- Show ability to provide a reliable supply of larger volumes with control over ingredient dimensions such as taste profile of mango purée or chili hotness level

Actions to improve market relevance

- Develop production capability of international mango varieties that are of exportable quality
- Develop know-how about cultivating Hass avocado
- Identify and introduce winning varieties of sweet potato and white sesame
- Strengthen supply of other fruits to offer dried assortments – pineapple, papaya

Actions to facilitate strengthening the competitiveness of sub-sectors

- Support cashew processors to operate at cost-efficient levels and to forge effective and reliable farmer supply chains
- Support establishment of mango purée and frozen mango capacity – CAVAC has conducted R&D on taste profiling and feasibility/viability assessments with several processors, they now require more support to finance production infrastructure (e.g., Indian processors get 50 per cent of the investment in production equipment subsidised)
- Support know-how in respect of farming and pre-processing of palm-sugar
- Seek better modes for improved yield of palm sugar
- Invest in common-use cold chain facilities
- Invest in common-use pack-house facilities
- Fast track adoption of GAP for fresh produce exports (start with an awareness-raising campaign on the urgency of GAP adoption with Thailand, making it mandatory)
- Support companies to acquire Food Safety Quality Management systems

Actions to Promote FDI

- Investment promotion to attract Filipino banana chipping companies to establish facilities in Cambodia
- Investment promotion to attract investment in palm sugar

The list below proposes the same interventions, but displays them by crop with a slightly greater crop focus.

Fresh Mango

Secure market access

- Keep up the effort to gain market approval from Japan and South Korea for fresh mango

Improve market relevance

- Develop production capability to achieve exportable-quality of international mango varieties
- Support companies with know-how for organic production and subsidise certification thereof

Strengthening sub-sectors' competitiveness

- Invest in common-use cold chain facilities
- Invest in common-use pack-house facilities
- Fast track adoption of GAP for fresh produce exports

- Set up mechanisms for traceability

Dried Fruit

Secure market access

- Gain permission for dried longan exports to China

Improve market relevance

- Develop production capability for exportable-quality, international mango varieties – to widen the range of dried on offer (and to expand the season)
- Identify best traditional variety for making (dried) banana chips
- Strengthen the supply of other fruits to offer dried assortments – pineapple, papaya

Strengthening sub-sectors' competitiveness

- Connect longan farmers/exporters with mango processors
- Set up mechanisms for traceability
- Support companies to acquire Food Safety Quality Management systems

FDI promotion

- Investment promotion to attract Filipino banana chipping companies to set up in Cambodia

Mango Purée / Frozen

- Support the establishment of mango purée capacity – starts with R&D on taste profiling
- Provide credit facilities to support start-up costs or explore PPP financing models
- Connect purée production to traceability of fresh mango

Cashews

Strengthening sub-sectors' competitiveness

- Support cashew processors to operate at cost-efficient levels and to forge effective and reliable farmer supply chains – a key component here is supporting better access to finance to enable processors to cover the purchase of raw nuts from farmers – large-scale purchase of high-value crop for a whole year of processing
- Support cashew processors to acquire Food Safety Quality Management systems
- Set up mechanisms for traceability

Palm-Sugar

FDI promotion

- Investment promotion to attract investment in farming and processing equipment
- Seek better modes for improved yield
- Support know-how about farming and pre-processing

Chili

Strengthening sub-sectors' competitiveness

- Fast track adoption of GAP for fresh produce exports (start with an awareness-raising campaign about the urgency of GAP adoption with Thailand making it mandatory)
- Support dried chilies companies to acquire Food Safety Quality Management systems
- Set up mechanisms for traceability

Avocado / Sesame / Sweet Potato

- Develop know-how and awareness about cultivating Hass avocado

- Identify and introduce winning varieties of sweet potato and white sesame
- Develop know-how and awareness about cultivating winning varieties of sweet potato and white sesame
- Invest in common-use cold chain facilities (for avocado and sweet potato)
- Invest in common-use pack-house facilities (for avocado and sweet potato)
- Fast-track adoption of GAP for fresh produce exports (for avocado and sweet potato)
- Support companies to acquire Food Safety Quality Management systems (for sesame)
- Set up mechanisms for traceability
- Support companies with know-how about organic production and subsidise certification thereof

Annex 1 Legal Market Requirements Guides

11.3.1 China Scenario

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Food safety Laws In 2021, several major regulations governing food import and export and some key national food safety standards were revised, issued for domestic comments, or notified to the WTO, including revised Administrative Measures on Import and Export Food Safety (Decree 249), and the updated National Food Safety Standard of Maximum Residue Limits (MRLs) for Pesticides in Food (GB 2763-2021). **Customs Procedures**: On 1 January 2022, the General Administration of Customs of China (GACC) began enforcing the Regulations on the Registration and Administration of Overseas Producers of Imported Food (Decree 248). The decree requires the registration of selected overseas food production and cold storage facilities that export most food, and a small number of animal feed products to China. China is a protocol market, where countries must gain market access before exporting fresh fruit. ▪ **1st exporting country needs to get the fresh crop (e.g., mango from Cambodia) approval (see GIZ study on the steps for this)** ▪ **For processed fruit and vegetables e.g., dried longan from Cambodia first obtain the approval** ▪ **Inspection and quarantine permit from SAQSIQ (not as stringent)**	Understanding China's new rules for Food Safety of Imports and Exports After this approval: - 'Phytosanitary Certificate' (including hygiene licence) - 'Certificate of Origin' - 'Wood Packing Certificate' (specific to exporting countries and regions in which China needs to control certain pests and diseases); all of the above certificates should be obtained from relevant departments in the exporting countries - 'Permit to Import Quarantine Material into the PRC' (specific to fruits, not applicable to vegetables). Normally, it takes six weeks from the time an application is submitted to receipt of the permit The animal and plant quarantine office at the port of entry in China will quarantine the product upon entry, and release it when it passes inspection. Import of Mangoes into China conditions Chinese customs website in English	**Labelling and Nutrition** ▪ **Mandatory nutrition information on processed foods** ▪ **Highlighting allergens e.g., peanuts or milk, in the list of ingredients** ▪ **Better legibility i.e., minimum size of text** ▪ **Requirements relating to information on allergens also cover non pre-packed foods including those sold in restaurants and cafés** ▪ **Health Claims – claims that a food can prevent, treat or cure a human disease may not be made**	Crops that this study focuses on are most likely not to be shipped to China in pre-packed form, but rather as bulk products, that will then be further processed in China to finally be sold to consumers in retail packaging. Exporters who will be exporting pre-packaged items, such as those targeting online retail sales of fruits or dried nuts, can refer to the USDA FAIRS Guide. **China FAIRS Country Report 2022**
Biological Safety	Nuts, sesame: aflatoxin Sesame: salmonella (major), E.coli Sesame: allergens	**Biotechnology**	China requires the labelling of certain products derived from biotechnology and prohibits the

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
▪ **Control of contaminants in foodstuffs** ▪ **Toxins e.g., mycotoxins, salmonella, E.coli and listeria** ▪ **Foreign matter e.g., stones, glass** ▪ **Health control of foodstuffs of non-animal origin – phytosanitary requirement – agricultural products must be accompanied by a health certificate**	Maximum level of mycotoxins in foods Mycotoxins in Foods National Standards Maximum level of contaminants in foods Contaminants in Foods National Standards Pathogen limits for food Pathogen limits for Foods National Food Safety Standard for Pathogen Limits for Food (GB 29921-2013).	▪ **Health control of Genetically Modified (GM) food**	importation and sale of any unlabelled or mislabelled products USDA Annual Agriculture Biotechnology GAIN report provides more details on the overall biotechnology environment in China.
Chemical Safety ▪ **Control of pesticide residues in plant and animal products intended for human consumption - maximum residue levels** ▪ **Control of heavy metal residues, e.g., lead, cadmium – maximum residue levels** ▪ **Contact materials – should not be transferred to food in a way that affects safety or quality**	Updated MRL for Pesticidal residues	**Packaging and Container Requirements** ▪ **Restrictions on containers and packaging materials**	The 2015 Food Safety Law defines food packaging materials and containers as 'products made of paper, bamboo, wood, metal, porcelain, plastic, rubber, natural fibre, chemical fibre, or glass and used to contain food or additives, or coating in direct contact with food or additives'. The Law also requires that food for direct consumption must be contained in small packages or use non-toxic and clean packaging material and containers. The containers for storing, transporting and loading/unloading food must be safe, maintain the food in a clean condition, and prevent food contamination. A long list of standards has been announced covering a wide range of these materials
Food enhancement agents ▪ **Flavourings e.g., esters for fruity flavours** ▪ **Colourants – e.g., Sudan I-IV for colouring and preserving red colour of e.g., chilies** ▪ **Additives and preservatives e.g., thickener – guar gum**	Sudan I-IV – chilies Dried mango – sweetener National Standards on Additives and on Nuts and Seeds	**Organic Food** ▪ **National Standard for Organic Products (GB/T 19630-2019)**	USDA - Revised Administrative Measures for Organic Product Certification National Standards

11.3.2 Australia/New Zealand scenario

The Australia and New Zealand food regulation system[47] is a cooperative arrangement between the Commonwealth of Australia, New Zealand, and Australian States and Territories that has developed and implemented uniform food standards. This system was jointly developed under a treaty between Australia and New Zealand signed in December 1995.

Australian labelling and advertising laws are different from those in the United States. This means that US labels are not acceptable and may need to undergo changes before entering this market. By far the largest issues for US products being held up at the border are because of incorrect nutrition information panels (Australia's is substantially different to the US panel), and products containing additives which are not approved for that particular use in Australia. New Zealand and Australia share the same food standards and labelling laws, allowing food packaged and labelled for Australia to also be sold in New Zealand.

In 2021 some significant changes are coming down the pipeline. To start with, the Ministry for Primary Industries is looking at creating a national organic standard that will create one system for certification and approval of organic products for sale in New Zealand. These changes are likely to include amendments to statements and claims on labels as well. Also, New Zealand is introducing country of origin labelling on certain foods (fruit and vegetables, pork and seafood). The regulations will require products in these categories to clearly state their country of origin and came into effective from 12 November 2021 with the regulation coming into place on frozen food from 23 May 2023.

Food Standards Australia New Zealand (FSANZ – www.foodstandards.gov.au) is a statutory authority operating under the Food Standards Australia New Zealand Act 1991. The Act provides a focus for cooperation between governments, industry, and the community to establish and maintain uniform food regulations in Australia and New Zealand.

The food standards development system is implemented by separate food legislation in each Australian State and Territory, and in New Zealand as well as by the Australia New Zealand Food Authority.

Although FSANZ develops food standards, the responsibility for enforcing and policing them rests with the respective States and Territories in Australia and the New Zealand government. Each government has one or more agencies responsible for food surveillance, which are tasked with ensuring the requirements of the ANZFSC are met.

The ANZFSC is divided into four parts. Chapter 1 deals with standards that apply to all foods. Chapter 2 deals with standards affecting particular classes of foods. Chapter 3 deals with food hygiene issues. Chapter 4 deals with Primary Production Standards.

These chapters however differ in their relevance to the two countries:

Chapter 1: New Zealand regulates its own Maximum Residue Limits (MRLs) for food (Standard 1.4.2 applies to Australia only)

Chapter 3: Deals with food hygiene issues in Australia only – New Zealand has its own food hygiene arrangements, and food hygiene is not part of the joint food standards system

Chapter 4: Deals with food hygiene issues in Australia only – New Zealand has its own food hygiene arrangements, and food hygiene is not part of the joint food standards system

The full code can be read at https://www.foodstandards.gov.au/code/Pages/default.aspx

Aspects unique to New Zealand, relevant to Chapters 3 and 4, are nicely simplified in this guide: https://www.mpi.govt.nz/dmsdocument/10826-getting-clearance-for-your-food-how-to-import-food-into-new-zealand

47 https://foodregulation.gov.au/

Australia/New Zealand scenario

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Food Definitions **In Australia there are a few common laws defining the products, standards etc., as well as separate product specific legislation. Most of the definitions are available from a common platform but the procedures are described separately**	**Schedule 22 Foods and classes of foods (includes interpretation for residue limits)** **All relevant requirements for importing foods in New Zealand** **Specific requirements for importing fresh fruits and vegetables** **FAIRS report New Zealand** **FAIRS report Australia** **Import Health standards New Zealand**	**Labelling and Nutrition** ▪ **Mandatory nutrition information on processed foods** ▪ **Highlighting allergens e.g., peanuts or milk in the list of ingredients** ▪ **Better legibility i.e., minimum size of text** ▪ **Requirements relating to information on allergens also cover non pre-packed foods including those sold in restaurants and cafés** ▪ **Health Claims – Claims that a food can prevent, treat or cure a human disease may not be made**	**Schedule 4 Nutrition, health and related claims** **Schedule 10 Generic names of ingredients and conditions for their use** **Schedule 11 Calculation of values for nutrition information panel** **Schedule 12 Nutrition information panels** **Schedule 13 Nutrition information required for food in small packages** **Sesame, Cashew, Palm Sugar: limited relevance for bulk product** **For pre-packed – high relevance, study all very carefully[48]** **Allergens: Sesame** **Guide to Food labelling in New Zealand**
Biological Safety ▪ **Control of contaminants in foodstuffs** ▪ **Toxins e.g., mycotoxins, salmonella, E.coli and listeria** ▪ **Foreign matter e.g., stones, glass** ▪ **Health control of foodstuffs of non-animal origin – phytosanitary requirements – agricultural products must be accompanied by a health certificate**	▪ **Nuts, sesame: Aflatoxin** ▪ **Sesame: Salmonella (major), E.coli** ▪ **Sesame: Allergens** ▪ **Palm Sugar: PAH Poly Aromatic Hydrocarbons** **Standard 1.6.1 Microbiological limits in food** **Schedule 27 Microbiological limits for foods** **Max level for contaminants** **Phytosanitary** **Health Certificate – all food products** **Compendium of microbiological criteria for food**	**Biotechnology** ▪ **Health control of Genetically Modified (GM) food (requires pre-market clearance)** ▪ **Permitted Novel Foods (requires pre-market clearance)** ▪ **Organic products Imports**	**Schedule 26 Food produced using gene technology** **Schedule 25 Permitted novel foods** **Proposals for Organic food regulations in New Zealand**

[48] Packaging and labelling regulations apply less to bulk shipped products - where an importer/distributor in countries packs and brands a product for retail. If however you export a pre-packed product e.g., palm sugar that is sold in-market in that form, then all the regulations apply and for that scenario. Regulations need careful study.

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
▪ **Biosecurity in New Zealand**	**New Zealand has strict biosecurity rules. Import Health Standards are developed by the Ministry of Primary Industries and are put in place to manage the biosecurity risks of imports. Requests for the development of new import health standards can be submitted to the MPI at any time** **Prohibited or restricted imports – item list**		
Chemical Safety ▪ **Control of pesticide residues in plant and animal products intended for human consumption - maximum residue levels** ▪ **Control of heavy metal residues, e.g., lead, cadmium – maximum residue levels** ▪ **Contact materials – should not be transferred to food to affect safety or quality**	**Schedule 19 Maximum levels of contaminants and natural toxicants (heavy metal traces)** **Schedule 20 Maximum residue limits (applies in Australia only)** **Maximum pesticide residue levels (AUS)** **Maximum pesticide residue levels (NZ)** **Generally Expected Levels (GELs) for metal contaminants**	**Packaging and Packaging Materials**	**There are no packaging or container size regulations for food products in Australia/NZ. Manufacturers may pack food in any size container. The Australia New Zealand Food Standards Code (ANZFSC) does not regulate the manufacture of packaging materials. Consequently, the ANZFSC does not specify which materials may be added to or used to produce food packaging materials or any articles and materials in contact with food. It is the responsibility of food manufacturers and retailers to ensure that the products used in association with food are safe and that the food complies with the general requirements in the Australian and New Zealand Food Acts and with the specific requirements in the ANZFSC which relate to contaminants**
Food enhancement agents ▪ **Flavourings e.g., esters for fruity flavour** ▪ **Colourants – e.g., Sudan I-IV for colouring and preserving red colour of e.g., chilies** ▪ **Additives and preservatives e.g. thickener – guar gum**	**Standard 1.3.3 Processing aids** **Standard 1.3.2 Vitamins and minerals** **Standard 1.3.1 Food additives** **Schedule 14 Technological purposes performed by substances used as food additives** **Schedule 15 Substances that may be used as food additives** **Schedule 16 Types of substances that may be used as food additives** **NZ – List of Food Additives** **Maximum permitted levels of additives in food**	**Testing Requirements** ▪ **Risk category food** ▪ **Surveillance category food** ▪ **Holding orders** ▪ **Quarantine**	

11.3.3 Singapore scenario

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Legal changes post COVID-19 in food safety **To further strengthen food security and ensure streamlined trade in food and agricultural products amidst the COVID-19 pandemic, SFA revised multiple regulations in 2020. Of particular note to US producers are SFA's removal of strict import timeframe restrictions on multiple frozen and processed meat products and the removal of an onerous registration procedure for processed beef and offal products**	▪ **All products under consideration** ▪ **Fair Report for import of food products in Singapore** ▪ **Amendment in Sale of Food Act can be seen here**	**Food Enhancement Agents** ▪ **Flavourings e.g., esters for fruity flavours** ▪ **Colourants – e.g., Sudan I-IV for colouring and preserving red colour of e.g., chilies** ▪ **Additives and preservatives e.g. thickener – guar gum**	**Dried mango, banana – sweetener** **The purity of permitted food additives must conform to the specifications in the Singapore Food Regulations (regulation numbers 15 (3) and (4)). Also, under regulation number 15(4) of the Food Regulations, food additives in food must comply with their respective specifications as suggested by the Joint FAO/WHO Expert Committee on Food Additives** **Combined Compendium of Food Additive Specifications (FAO/WHO)** **The Food Regulations contain rules relating to food additives and their use.[49]** **The Third schedule to the Eleventh schedule of the food regulations – specific additive permissible limits** **SFA List of food additives permitted**
Labelling and Nutrition ▪ **Mandatory nutrition information on processed foods** ▪ **Highlighting allergens e.g., peanuts or milk, in the list of ingredients** ▪ **Better legibility i.e., minimum size of text** ▪ **Requirements relating to information on allergens also cover non pre-packed foods including those sold in restaurants and cafés** ▪ **Health Claims – Claims that a food can prevent, treat or cure a**	**Labelling requirements for pre-packed foods:** **General labelling requirements:** ▪ **Name or description of food** ▪ **Statement of ingredients** ▪ **Declaration of foods that cause hypersensitivity** ▪ **Declaration of net content in package** ▪ **Name, address of producer/importer** ▪ **Country of origin of food** **Additional labelling requirements:** ▪ **Expiry date marking** ▪ **Food containing sweetening agents** ▪ **Special purpose foods, sugar-free foods, low calorie foods, diabetic foods etc.**		

49 Main types of food additives covered in the regulations: 1. anti-caking agents, 2. anti-foaming agents, 3. antioxidants, 4. sweetening agents, 5. chemical preservatives, 6. colouring matter, 7. emulsifiers and stabilisers, 8. flavouring agents, 9. flavour enhancers, 10. humectants, 11. nutrient supplements, 12. sequestrants, 13. gaseous packaging agents, 14. general purpose food additives.

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
human disease may not be made.	▪ **Prohibited claims on food labels and advertisements** ▪ **SFA – Guide to Food Labelling and Advertisements** **Possible relevance for packaged banana chips or fresh cut mango. For fresh mango or avocado – unprocessed – not pre-packed food – no relevance**		
Chemical Safety ▪ **Control of pesticide residues in plant and animal products intended for human consumption - maximum residue levels** ▪ **Control of heavy metal residues, e.g., lead, cadmium – maximum residue levels** ▪ **Contact materials – should not be transferred to food in a way that affects safety or quality**	**Pesticide residue contained in any food must not exceed the maximum limit stated in the prescribed levels (Maximum Residue Limit ppm) of the positive list of pesticides in the Ninth Schedule of the Food Regulations. Unless otherwise prescribed in the Food Regulations, pesticide residue contained in any food must not exceed the maximum residue limit adopted by the Joint FAO/WHO Codex SFA Guidelines for Pesticide Registration** **Heavy Metals: Foods containing arsenic and lead in amounts in excess of those specified in the Tenth Schedule are not permitted for import and sale in Singapore (regulation no. 31 (1))**		
Biological Safety ▪ **Control of contaminants in foodstuffs** ▪ **Toxins e.g., mycotoxins, salmonella, E.coli and listeria** ▪ **Foreign matter e.g., stones, glass** ▪ **Health control of foodstuffs of non-animal origin – phytosanitary requirement – agricultural products must be accompanied by a health certificate**	**Trader's Licence is required to import fresh fruit and vegetables (under the Control of Plants Act)** **Mycotoxins: food containing aflatoxin B1 or total aflatoxins (B1, B2, G1 and G2) in excess of 5 parts per billion are not permitted (Regulation no. 34).**	**Packaging and Container Regulations** **'Container' includes 'any form of packaging of food for sale as a single item, whether by way of wholly or partly enclosing the food or by way of attaching the food to some other article and in particular includes a wrapper or confining band' and 'package' includes 'every means by which food may be cased, enclosed, contained or packed'**	**Under the Food Regulations package and/or container guidelines, the following are prohibited:** **1. Packages/containers that contain more than 1ppm of vinyl chloride monomer** **2. Any package or container that is likely to yield to its contents more than 0.01 ppm of vinyl chloride monomer** **3. Any package or container that is likely to yield to its contents any compounds known to be carcinogenic, mutagenic, teratogenic, poisonous or injurious**
		GMO Foods	**Genetically engineered foods are controlled items in Singapore. They are subject to special declaration, review, inspection and testing procedures that are implemented by the Food Control Division of the SFA**

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
The Agri-Food and Veterinary Authority (AVA) was the national authority responsible for food and agriculture matters in Singapore but it ceased to exist in April 2019. A new government agency called the Singapore Food Agency (SFA) has taken over all food-related regulatory responsibilities from AVA directly since its closure.			

11.3.4 Malaysia scenario

Malaysia did not make any major changes to its food import requirements in 2021.

The Malaysia Food Act of 1983 and the Food Regulations of 1985 dictate national safety and quality standards for most prepared and/or packaged foods. The Food Safety and Quality Division of the Ministry of Health is responsible for implementing and enforcing all standards under these statutes. All food imports are subject to random checking and sampling by the Malaysia Quarantine and Inspection Service at the 28 entry points throughout the country to ensure all products comply with the prescribed national standards and regulations.

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Labelling and Nutrition ▪ **Mandatory nutrition information on processed foods** ▪ **Highlighting allergens e.g., peanuts or milk, in the list of ingredients** ▪ **Better legibility i.e., minimum size of text** ▪ **Requirements relating to information about allergens also cover non pre-packed foods including those sold in restaurants and cafés** ▪ **Health Claims – claims that a food can prevent, treat or cure a human disease may not be made**	Restrictions and limitations relating to packaging materials pertain to: language used, form and manner of labelling, size and colour of letters, date marking, ingredient strength, matters forbidden on labels, nutrition labelling, nutrient content and function claims Part IV Labelling – Food Safety Info System Malaysian labelling requirements are also well covered in USDA Malaysia Food and Agricultural Import Regulations and Standards (FAIRS) Report	**Food Enhancement Agents** ▪ **Flavourings e.g., esters for fruity flavours** ▪ **Colourants – e.g., Sudan I-IV for colouring and preserving red colour of e.g., chilies** ▪ **Additives and preservatives e.g. thickener – guar gum**	Sudan I-IV – chilies Dried mango – sweetener Food additive labelling requirements Part V Food Additive and Nutrient Supplement – Food Safety Info System
Latest FAIRS report	For all food products food regulation 1985	**Legal Framework for imports of Food and Food additives in Malaysia**	Legal Framework in South Asia with special reference to Malaysia
Biological Safety ▪ **Control of contaminants in foodstuffs** ▪ **Toxins e.g., mycotoxins, salmonella, E.coli and listeria** ▪ **Foreign matter e.g., stones, glass** ▪ **Health control of foodstuffs of non-animal origin – phytosanitary requirement – agricultural products must be accompanied by a health certificate**	Dried Chilies: Aflatoxin, ochratoxin, salmonella Import Permit: The import of plant and plant products into Malaysia is governed by the Agricultural Pests and Noxious Plants (Import/Export) Regulations 1981. The aim of the plant quarantine regulations is to control the introduction of pests and diseases from foreign imports. Import permits are issued by Director General MAQIS. Phytosanitary Health Certificate. The inspection and certification of consignments of plants, plant parts or plant	**Standards and Particular Labelling Requirements for Food**	Standards have been specified for a long list of food products – also including: chilies, fresh fruit, and dried fruit Part VIII Standards - Food Safety Info System

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
	products, processed or otherwise, must conform with the current phytosanitary requirements. Micro-organisms and Their Toxins - Fifteenth Schedule		
Chemical Safety ▪ **Control of pesticide residues in plant and animal products intended for human consumption - maximum residue levels** ▪ **Control of heavy metal residues, e.g., lead, cadmium – maximum residue levels** ▪ **Contact materials – should not be transferred to food in a way that affects safety or quality**	The maximum pesticide residue limits (MRL) in food are also listed in the Sixteenth Schedule of the Food Regulations 1985. If the pesticide is not specified in the Sixteenth Schedule, the proportion is that recommended in the *Codex Alimentarius*		

11.3.5 European Scenario

United Kingdom

On 1 January 2021, Great Britain (England, Wales and Scotland) exited the EU single market and customs union. Under the Northern Ireland (NI) Protocol, NI will remain part of the single market and customs union for goods to maintain integrity of the EU border and minimise disruption to trade on the island of Ireland. The UK has adopted its own customs and food laws, largely along similar lines to those of the EU, but with the flexibility to change and negotiate trade agreements on its own. Everything but Arms for Least Developed Countries, for example, stays intact.

The Consequence of Brexit may be seen here

EU

On 20 May 2020, the European Commission published its 'Farm to Fork Strategy' which foresees regulatory changes that will impact EU food labelling legislation in the following five years. New requirements are expected to be adopted by the European Union including food sustainability labelling, animal welfare labelling, additional origin labelling, marketing standards for fishery and aquaculture products, nutrient profiles and mandatory front-of-pack nutrition labelling.

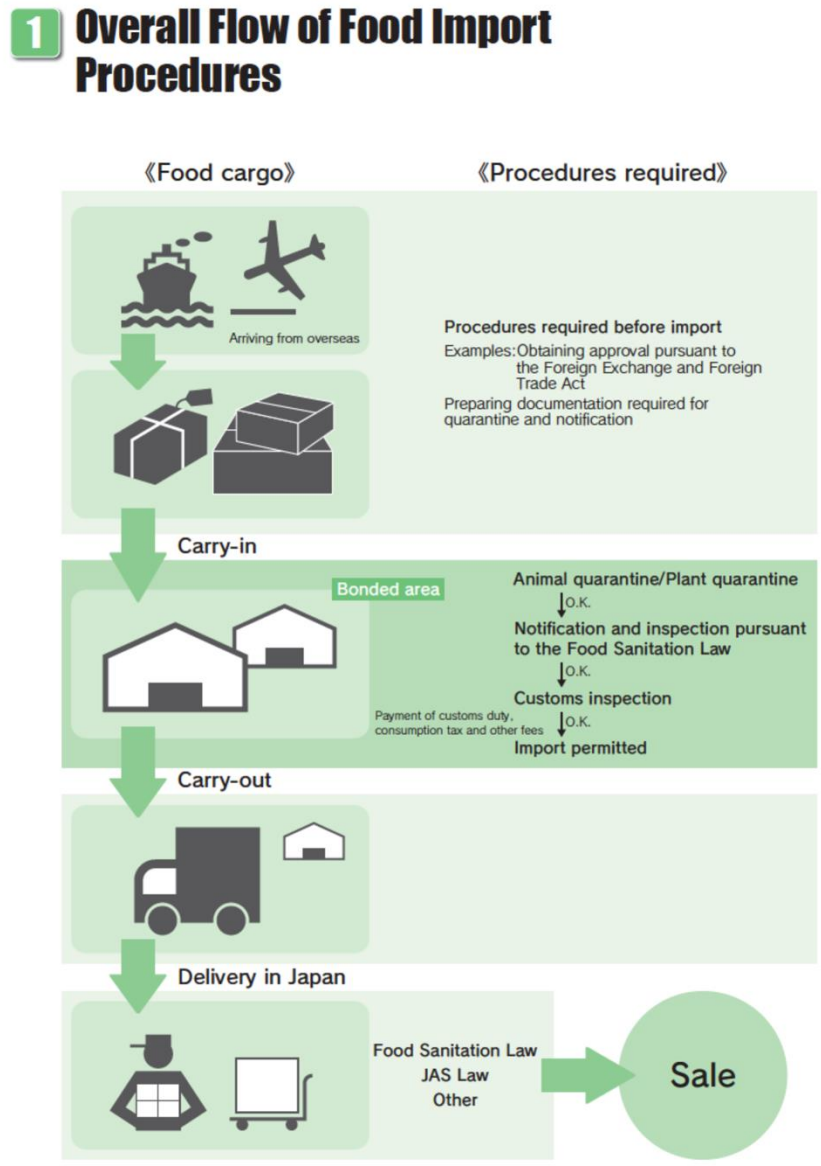
Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Minimum Marketing Quality Requirement Standard **(see Chapters on crops)**	▪ **EU Regulations for some fruits and vegetables e.g., apples, lettuce** ▪ **No EU regulation (then UNECE/*Codex Alimentarius* Standards are followed e.g., mango, avocado, nuts)** ▪ **If no product specific marketing standards exist, the General Marketing Standards of Regulation (EU) 543/2011 apply**	**Labelling and Nutrition** ▪ **Mandatory nutrition information on processed foods** ▪ **Highlighting allergens, e.g., peanuts or milk, in the list of ingredients** ▪ **Better legibility i.e., minimum size of text** ▪ **Requirements relating to information about allergens also cover non pre-packed foods including those sold in restaurants and cafés** ▪ **Health claims – claims that a food can prevent, treat or cure a human disease may not be made**	**Only relevant for pre-packed food goods**
Food and Agri import regulation and Standards	▪ **Latest FAIR report** ▪ **Latest FAIR report of United Kingdom**	**Environment related legislation** **Farm to Fork Strategy** **Coming under EU Green Deal**	**Farm to Fork Strategy**
Fresh Fruits and vegetable imports in the EU - A CBI perspective	▪ **Market information in Fresh Fruits and vegetables**	**Fresh fruits and vegetables import requirements in the UK**	**UK guidance note on export and import of fresh fruits and vegetable**
Biological Safety: ▪ **Control of contaminants in foodstuffs** ▪ **Toxins e.g., mycotoxins, salmonella, E.coli and listeria** ▪ **Foreign matter e.g., stones, glass** ▪ **Health control of foodstuffs of non-animal origin – phytosanitary requirements – agricultural products must be accompanied by a health certificate**	**Nuts, sesame: aflatoxin** **Sesame: salmonella (major), E.coli** **Sesame: allergens** Max. level for contaminants **Phytosanitary** **Health Certificate – all food products** Food contaminant factsheet	**Biotechnology** ▪ **Health control of genetically-modified food and novel food genetically-modified organism (GMO) products are not allowed in the EU**	**Certificate confirming 'No GMO' required**
Chemical Safety:	Maximum pesticide residue levels web database **Fresh fruit and vegetables**	**Traceability**	

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
▪ **Control of pesticide residues in plant and animal products intended for human consumption - maximum residue levels** ▪ **Control of heavy metal residues, e.g., lead, cadmium – maximum residue levels** ▪ **Contact materials – should not be transferred to food in a way that affects safety or quality**	**Restrictions relating to food contact materials** **All products in this study**	▪ **Tracing food and feed throughout the food chain is very important for the protection of consumers, particularly when food and feed are found to be faulty. The General Food Law Regulations define traceability as the ability to trace and follow food, feed, and ingredients through all stages of production, processing and distribution**	
Food enhancement agents: ▪ **Flavourings e.g., esters for fruity flavours** ▪ **Colourants – e.g., Sudan I-IV for colouring and preserving red colour of e.g., chilies** ▪ **Additives and preservatives e.g., thickener – guar gum**	**Sudan I-IV – chilies** **Dried mango – sweetener** **Contaminants information**	**Packaging and Packaging Materials** ▪ **Restrictions on wood packaging materials and recyclability of other packaging materials**	
RAPID Alert System: ▪ **RASFF notifications usually report on risks identified in food, feed or food contact materials that are placed on the market in the notifying country or detained at an EU point of entry at the border with a non-EU neighbouring country. The notifying country reports on the risks it has identified, the product and its traceability and the measures it has taken**	**Among other notifications, RASFF includes border rejection notifications. A 'border rejection notification' concerns a consignment of food, feed or food contact material that was refused entry into the EU because of a risk to human health and also to animal health or to the environment if it concerns feed.** **Cambodian exporters need to be well aware that in the event of a rejection (a) their shipment is lost without any compensation and (b) their chances of selling on the EU market after a consignment is rejected are very slim**	**Organic Product Labelling (voluntary)** ▪ **Choosing to put organic produce on the market is voluntary but it needs to comply with certain conditions**	**You (or your importer) must apply for an import authorisation from organic control bodies. After being audited by an accredited certifier, you may put the EU organic logo on your products, as well as the logo of the standard holder**

11.3.6 Japan Scenario

Guide to Food Import Japan 2019 : Mipro

Overall Flow of Food Import Procedures



Import of Plants- Procedure

2 Laws and Regulations Applied to Import Food

Japanese regulations concerning food import may be generally categorized according to the following aims:

(1) Safeguarding human health under the Food Sanitation Law;
(2) Safeguarding domestic animal and plant health through plant quarantine (under the Plant Protection Law) and animal quarantine (under the Domestic Animal Infectious Diseases Control Law); and
(3) Seeking a balance between cooperation in international society and the impact on domestic industry.

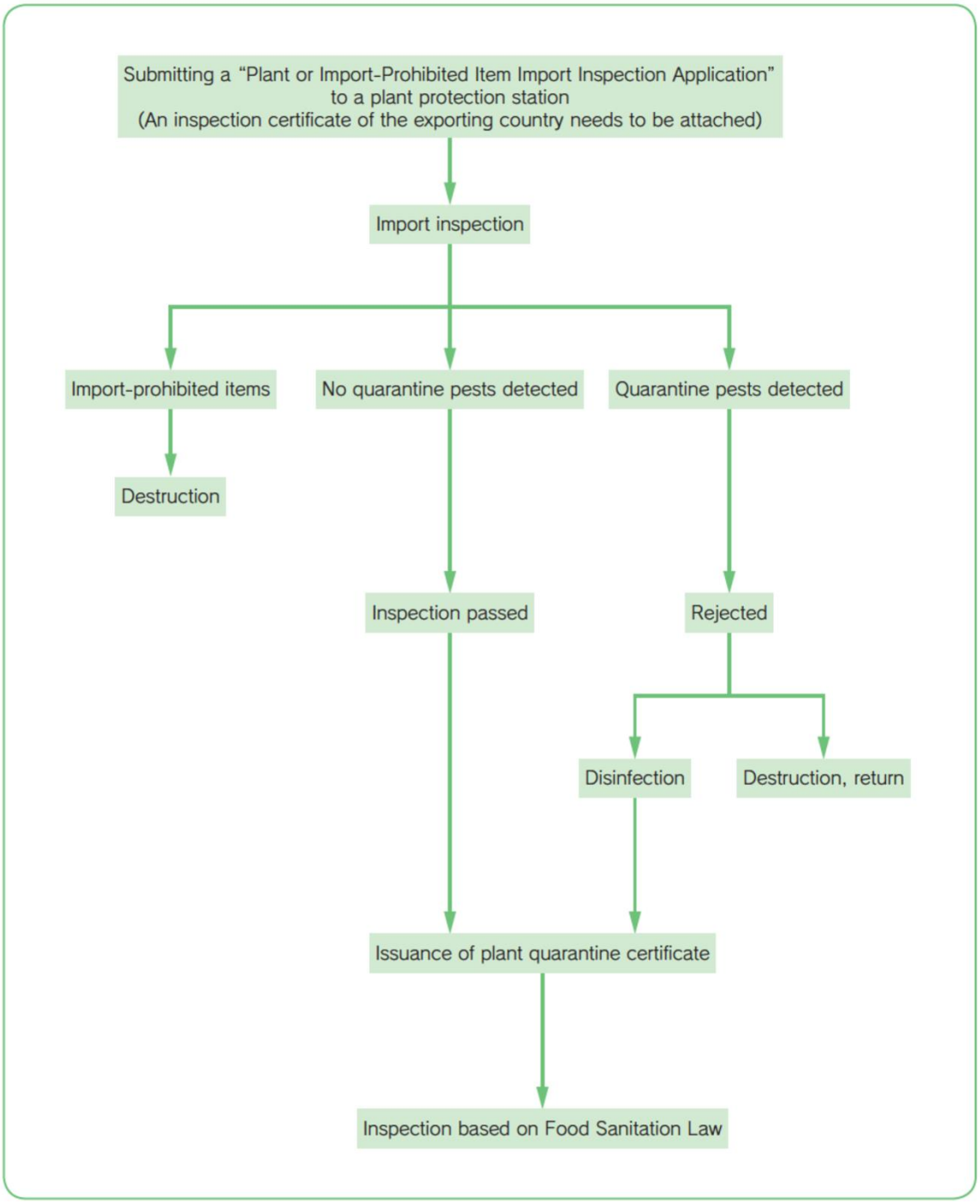
The main regulations pertaining to each food category are as follows:

The Main Japanese Food Import Laws

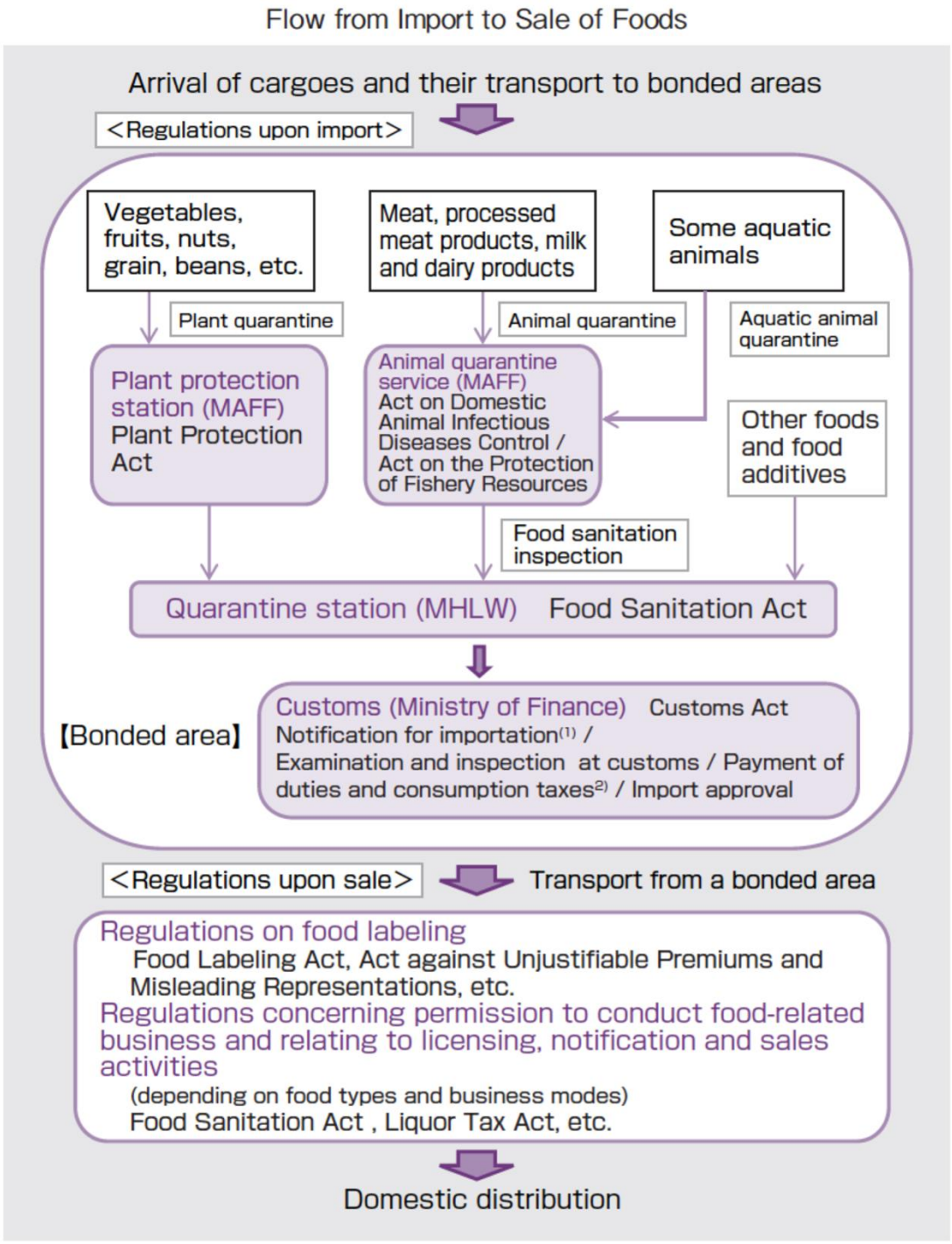
	Food Sanitation Law	Plant Protection Law	Domestic Animal Infectious Disease Control Law	Foreign Exchange and Foreign Trade Act	Other
Vegetables and fruits (fresh, frozen, dried)	○	○ Note 1		○ Items notified in import public announcements	
Meat and meat products	○		○	○ Items notified in import public announcements	
Fishery products (fresh, frozen, chilled, salted)	○			○ Items notified in import public announcements	
Tea, black tea and coffee	○	Note 2			
Rice	○	○			Act on Stabilization of Supply, Demand and Prices for Staple Food
Liquor	○				Liquor Tax Law
Salt	○				Salt Business Law
Various processed products (canned, bottled, etc.)	○	○ Note 3	○ Note 1	○ Items notified in import public announcements	

Note 1: Examination is not necessary for some foods depending on their processing method. Please inquire at the plant protection station or animal quarantine service for further details.
Note 2: Fresh herbs, raw coffee beans, etc. imported as ingredients must be inspected. Please inquire at the plant protection station for further details.
Note 3: In general, food sterilized by heat such as canned fruits will not need to be inspected. Please inquire at the plant protection station for further details.

Flow of General Procedures



Flow from Import to Sale of Food products



Notes (1) When any permission or approval is required under laws and regulations other than those related to tariffs and duties, an importer must obtain the required permission or approval under relevant laws and regulations and obtain confirmation by proving such fact upon making an import declaration or receiving an examination and inspection at customs.

(2) In the case of importing liquor, an importer must affix a label in Japanese under the Act on Securing of Liquor Tax and on Liquor Business Associations, and the Food Labeling Act, etc. to the products within a bonded area, and is permitted to transport them out of the bonded area only after paying duties, consumption taxes and liquor tax.

Import Procedures for Fresh Fruits and vegetables

FRUITS AND VEGETABLES	
The following information is required for advanced screening: the product's properties and processing method (including heating or freezing temperature if applicable), the plant's English name and the plant's scientific name. Regulations vary for the same product depending on processing methods and properties, i.e. whether the product is fresh, dry, frozen, heated, prepared or otherwise treated. However, items that have clearly been heated (roasted coffee, fried potatoes, etc.) or prepared (pickles, canned beans, etc.) do not require quarantine. Dried products (such as dried tomatoes, dried beans) may require inspection.	
Fresh fruits and vegetables	Fresh fruits and vegetables must undergo plant quarantine and require a quarantine certificate (original) during transport. Paperwork requires time and money. If insects are discovered on arrival in Japan, more time and money is needed for fumigation. In some cases, products may be disposed of immediately. If any dirt or mud is found attached to the plants, expensive procedures are required for cleansing, selection, boiling and disposal. After plant quarantine, some plants must undergo a residual pesticide concentration inspection at the Ministry of Health, Labour and Welfare. **Please note that clearing customs of fresh fruits and vegetables is extremely difficult.** * The import of fresh fruits and vegetables from some countries are prohibited in accordance with the Plant Protection Law. Dried fruits are restricted if they have simply been sun-dried without being treated through sugar preservation, heating or some other method.

11.3.7 Japan

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Governing Agencies **There are seven major laws governing food and agricultural products in Japan. Together, these laws cover food safety and sanitation, labelling, plant health, animal health, nutrition standards, and quality assurance. The Food Sanitation Act was revised in 2018 with several changes taking effect in 2020, including the introduction of a positive list for food packaging materials**	▪ **Fresh Fruits and vegetables** ▪ **Other related products** ▪ **FAIRS Report** ▪ **Classification of Foods**	▪ **Phytosanitary requirements** **On 5 August 2020, Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF) revised the list of Phytosanitary Certificate (PC) exemptions and implemented the updated Plant Protection Act. Japan and notified the initial proposal to the World Trade Organization (WTO) in October 2019 (see JA2019-0193). On 6 August 2020, Japan updated the WTO notification (G/SPS/N/JPN/684/Add.1) to include a three-year transition period.**	▪ **Revised Phytosanitary requirements**
Plant Protection Laws ▪ **Control of contaminants in foodstuffs** ▪ **Toxins e.g., mycotoxins, salmonella, E.coli and listeria** ▪ **Foreign matter e.g., stones, glass** ▪ **Health control of foodstuffs of non-animal origin – phytosanitary requirements – agricultural products must be accompanied by a health certificate**	**Plant protection law in English**	▪ **Packaging sustainability measures** **To reduce Japan's plastic consumption, from 1 July 2020, all Japanese retailers, including grocery stores and restaurants, will be required to impose a mandatory fee of at least 1 yen (approximately US$0.01) per plastic shopping bag. The mandatory plastic bag fee program is implemented in the ministerial ordinance related to the Container Packaging Recycling Law under the jurisdiction of the Ministry of Economy, Trade and Industry (METI) (JA2020-0134).**	**Mandatory Plastic Bag fees**
Implementation of Imported Foods monitoring Plan *Targeted foods* ▪ **Agricultural foods and their processed products *Vegetables and Fruits***	**Fruits and Vegetables: Lead and arsenic, and also for fruits to be eaten without peeling** **Residual agricultural chemicals including pesticides are also tested for this category** **Nuts like cashew : Salmonella** **Implementation Plan for testing**	▪ **Pesticides and Contaminants MRLs** ▪ **Japan uses a positive list system for residues of agricultural chemicals (i.e., pesticides, feed additives, and veterinary drugs) in food. This system establishes maximum residue limits (MRLs) for the pairing of an agricultural chemical and a commodity. The complete list of MRLs for agricultural chemicals in foods can be found at http://db.ffcr.or.jp/front/.**	**Database of various foods for MRLs** **Table of MRLs for Mango**

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
▪ **Japanese imposition of Maximum Residual Limits (MRLs) in respect of food products** ▪ **It is applicable to all categories of food products as described above in Section I under Classification of Food.**	**List of food products with MRLs** **All categories of fruit, vegetables, nuts, and oilseeds, with the exception of mango, sesame and avocado in certain categories.**		
▪ Need for Irradiation **Irradiation of food is not permitted in Japan, with the exception of potatoes, which may be irradiated for the purpose of suppressing germination only, and must be labelled accordingly. Irradiation inspection is conducted on a wide range of foods including (but not limited to): livestock products (e.g., meats and dairy), seafood (e.g., fish and shellfish), plant foods (e.g., vegetables, fruits, nuts, grains, and spices) and processed foods containing livestock, seafood and plant products**	**List of items to be irradiated before exporting to Japan**		
Food Additives Labelling ▪ **The labelling of food additives, including post-harvest fungicides (PHFs), is mandatory in Japan and overseen by the CAA. The CAA requires additives to be labelled by substance names (e.g., DL-Alanine), by the combination of substance names and their functions (e.g., preservative (sorbic acid)), by commonly known names (e.g., 'Vitamin C' instead of 'Sodium L-ascorbate'), or by collective names (e.g., flavouring agents, acidifiers, etc.).**	**Jetro Guide** **Sodium Hypochlorite – must not be used on sesame seeds.** **Potassium Pyrosulfite, Sodium Hydrosulfite, Sodium Pyrosulfite, Sodium Sulfite, Sulfur Dioxide, Amanatto (sweetened adzuki beans) (residual level as sulfur dioxide). Less than 0.1 g/kg. Not permitted on sesame seed, beans, or vegetables.**		

11.3.8 South Korea Scenario

South Korea Food and Agricultural Import Regulations and Standards – A country report

https://www.fas.usda.gov/data/south-korea-food-and-agricultural-import-regulations-and-standards-country-report

Korea's procedures on food importation are based on the following laws:

1. Food Sanitation Act: aims to prevent danger from hygiene hazards in food products. Another goal of this Law is to improve national health through qualitative advances in food and nutrition.
2. Plant Quarantine Act: aims to prevent expansion and entry of noxious insects and contribute to safety and production in agriculture and forestry.
3. Livestock Epidemic Prevention and Control Act: aims to prevent emergence or expansion of livestock epidemics and contribute to the development of the livestock industry, and an improvement in public health.
4. Foreign Trade Act: aims to promote overseas trade and develop the national economy through increased trade and commerce.
5. Laws related to food labelling: include regulations enabling consumers to rationally choose products based on information by displaying food-related information on the containers or packaging.
6. Other laws related to imports include the Grain Management Act, and the Liquor Tax Act.

Comparison of Goods covered by each Law

Category	Food Sanitation Act	Plant Quarantine Act	Livestock Epidemic Prevention and Control Act	Foreign Trade Act	Others
Vegetables, fruits (fresh, frozen, or dried)	★	★ Note 1		★ (Integrated notice)	
Meat and processed meat products	★		★	★ (Integrated notice)	
Fish and clams (fresh, refrigerated, frozen, salted or dried)	★			★ (Integrated notice)	
Processed tea and coffee	★	Note 2			
Rice	★	★ Note 1			Grain Management Act
Alcoholic beverages	★				Liquor Tax Act
Processed food (canned, bottled, or retort)	★	Note 3	★ Note 1	★ (Integrated notice)	

★ Laws and regulations by food category.

https://www.aseankorea.org/files/upload/board/88/6/part2.pdf

Documents required for Imports

- Inspection certificate (vegetables, fruits, mushrooms, and others)
- Export Certificate (for frozen fruits, certificate stating that fruits have been frozen under -17.8C)
- Exporters must prepare documents necessary for inspection and quarantine according to the type of food and exporting country, such as sanitary certificate, inspection certificate or inspection report.

Fresh Fruit and vegetables and Phytosanitary certificates

Item	Areas allowed for import	Item	Areas allowed for import
Persimmon	USA (Hawaii, Texas, and Florida excluded) Japan New Zealand	Tangerine	USA (Hawaii, Texas, and Florida excluded) Japan New Zealand
Sweet persimmon	Japan New Zealand	Durian	Thailand
Strawberry	Japan	Sweet cherry	Japan
Lime	USA (Hawaii, Texas, and Florida excluded)	Cowberry	Nepal Indonesia
Lemon	USA (Hawaii, Texas, and Florida excluded) Japan (Kyushu and Ryukyu archipelago excluded) New Zealand	Melon	USA (Hawaii excluded) Japan Uzbekistan New Zealand
Pomegranate	Iran (Sistan and Baluchistan Province excluded) Uzbekistan	Avocado	USA (Hawaii and Texas excluded) New Zealand
Citron	Japan (Kyushu and Ryukyu archipelago excluded)	Oriental melon	Japan Uzbekistan
Grapefruit	USA (Hawaii, Texas, and Florida excluded) Japan (Kyushu and Ryukyu archipelago excluded)	Kiwi	USA (Hawaii excluded) Japan New Zealand
Coconut	All regions	Tomato	Japan
Pineapple	All regions	Unripe banana	All regions
Grape	USA (Hawaii and Texas excluded) Japan New Zealand	Pumpkin	Japan New Zealand

https://www.aseankorea.org/files/upload/board/88/6/part2.pdf

Fresh Fruits and Vegetables and special condition of imports

Item	Country	Import conditionsRequirements for import
Mango	Taiwan	Heat treatment at the site of production (30 minutes, 46.5℃), on-site inspection by Korean plant quarantine inspectors
	Philippines	Heat treatment at the site of production (10 minutes, 46.5℃), on-site inspection by Korean plant quarantine inspectors
Mango	Thailand	Heat treatment at the site of production (20 minutes, 47℃ or higher), on-site inspection by Korean plant quarantine inspectors
	Australia	Mangoes or fresh fruits produced at registered fruit gardens, fruit collection sites, or heat treatment sites for import to Korea. Those inspected for harmful insects and heat-treated (15 minutes, 47℃) and inspected by Korean plant quarantine inspectors at the site.
Papaya	Philippines	Heat treatment at the site of production (70 minutes, 46.5℃), on-site inspection by Korean plant quarantine inspectors
Grape	Chile	Statement that "the products have been harvested in an area recognized to be free of fruit flies" on the Phytosanitary Certificate. However, over the period of emergency import prohibition due to findings of a presence of Mediterranean fruit flies, the certificate must state that "the products do not bear fruit flies and have been harvested in areas other than those regulated among the designated harvest areas for export to Korea"
Kiwi	Chile	Statement that "the products have been harvested in an area recognized to be free of fruit flies" on the Phytosanitary Certificate. However, over the period of emergency import prohibition due to findings of a presence of Mediterranean fruit flies, the certificate must state that "the products do not bear fruit flies and have been harvested in areas other than those regulated among the designated harvest areas for export to Korea"
Sweet cherry	New Zealand	The Phytosanitary Certificate must state that "there are no codling moth and shot hole diseases"
	USA	MB smoking (2 hours) on the site of production, disinfection treatment and the name of counter of the place of origin on the Phytosanitary Certificate, a statement that "the products have not been infected by harmful animals prohibited to be imported, Stigmina carpophila and Blumeriella jaapii based on the inspection"
	China	Fresh sweet cherry produced in Shantung, China, at registered fruit gardens or fruit collection sites. The non-occurrence of harmful inspects must be verified and checked through cultivation site inspection. This must be stated on the Phytosanitary Certificate.
Sour sop	Taiwan	Heat-treated (20 minutes, 46.2℃) at the site of production, low temperature treatment (42 hours, 0-2℃), inspected by Korean plant quarantine inspectors at the site.
Ponkan orange	Taiwan	Low temperature treatment on the site (14 days, 0-1℃) , inspected by Korean plant quarantine inspectors at the site.
Sweet orange	South Africa	Low temperature treatment on the production site or when being transported (24 days, -0.6℃ ±0.6℃ or below), inspected by Korean plant quarantine inspectors at the site.

https://www.aseankorea.org/files/upload/board/88/6/part2.pdf

11.3.9 Korea

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
Governing Law **Plant Quarantine Act: aims to prevent expansion and entry of noxious insects and contribute to safety and production of agriculture and forestry** **Plant Quarantine**	**For all fruits and vegetables -** Each consignment of items, subject to plant quarantine with few exemptions, should be accompanied by a Phytosanitary Certificate (PC) issued by the National Plant Protection Organization (NPPO) of the exporting country	Among the prohibited fresh fruits produced in ASEAN Countries, the following are conditionally allowed. **Fresh Fruits and Vegetables and Special Conditions for Imports**	**Mango, avocado, sweet potato, cashew**
Labelling requirements : **All processed foods are required to follow the labelling requirements under the Food Sanitation Act.** The Food Sanitation Act is the cornerstone of the regulation of food products in Korea. Standards for food labels are implemented by the Korea Food and Drug Administration, through regulations on labels for food additives, equipment, packages, and containers, including those relating to hygienic food handling. Basic information must be provided on product and company names, circulation period, raw materials used, as well as nutrients and organic food ▪ **Food sanitation Act**	Nuts, sesame, banana chips, or other processed food products manufactured from the fruits under consideration etc., if sold in packed form to retail customers	**Food Sanitation Act along with other laws as listed below :** • Health Functional Food Act: promotes the quality of functional health food and provides precise information for consumers • Agricultural Products Quality Control Act regulates details as to agricultural products and display of their origin • Foreign Trade Act regulates labels on the country of origin of products	**Nuts, sesame, banana chips, or other processed food products manufactured from the fruits under consideration etc., if sold in packed form to retail customers**
Food Safety The Korea Customs Service (KCS), MFDS, the National Quarantine Office (for ports that do not have an MFDS (Ministry of Food and Drug Safety) regional offices), and the Animal and Plant Quarantine Agency (APQA) are the agencies involved in the import clearance process. In addition to MFDS residue testing for agricultural chemical, aflatoxin, and other contaminants, plant products, including fresh vegetables, fruits, and	**All fresh fruit and vegetable products** **MFDS food inspection**	**Pesticides and other contaminants** The MFDS is responsible for regulating pesticide residues in foodstuffs, in accordance with the maximum residue levels (MRLs) set in the Food Code. As of March 2022, MFDS had set MRLs for 518 pesticides in agricultural products. The Food Code also lists MRLs for 135 pesticides and 192 veterinary drugs in meat, fish, eggs, and milk products	**All fresh fruit and vegetables as well as processed food products for pesticide residue and heavy metals**

Legal requirements	Relevance to crops in this study	Legal requirements	Relevance to crops in this study
grains are subject to quarantine inspection		**MRL Database**	

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