

December 2021

2021 Industry Report: Cassava Starch



Executive Summary

Production and Consumption

- Cassava starch, commonly known as Tapioca, is extracted from the cassava plant roots found in equatorial regions. The production of cassava plants is dominated by Nigeria (19%), the Democratic Republic of the Congo (13%), Thailand (10%), Ghana (7%), and Brazil (6%).
 - Even though Nigeria is one of the top cassava producers, its ability to process cassava is minimal. Thailand is the largest producer of tapioca starch, with a capacity of over 2M MT per year. Following Thailand are Brazil, Nigeria, and Indonesia as the top tapioca-producing countries.
 - Most of the consumption is concentrated in tropical countries across Africa, Asia, and Latin America. It is the third-used source of calories after rice and corn in these regions.
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Trade

- In 2020, a total of 5.1M MT of tapioca was exported in the world. Thailand, Vietnam, Laos and Indonesia were the leading tapioca exporters.
- Thailand and Vietnam dominated tapioca exports with a total share of 94% in the exported volume. In terms of value, tapioca worth USD 2.2 billion was exported in 2020, in which Thailand had a share of 53%.
- Following Thailand is Vietnam with a share of 40 % in the global export value, Laos with 2%, and Indonesia with a small percentage of 1.4%.

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Part I

Product Information: Cassava Starch (HS Code: 110814)

- 1.1 Production Process: Cassava Roots to Tapioca
- 1.2 Industrial Applications
- 1.3 Biofuel Industry Applications
- 1.4 Food and Beverage Applications

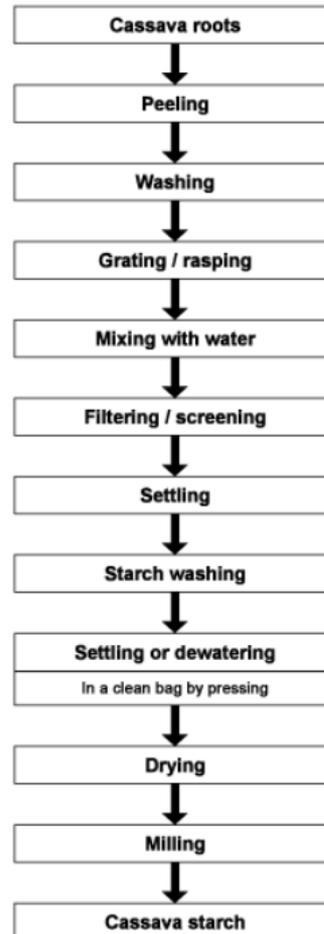
Product Information: Cassava Starch (HS Code: 110814)

Cassava starch, commonly known as Tapioca, is extracted from the cassava plant roots found in equatorial regions. The name cassava is generally applied to the plant's origins, whereas tapioca is the name given to starch and other processed products. The cassava roots' large central pith is the starch-reserve flesh, which can range in starch content from as low as 15% to as high as 33%. Tapioca is a staple food for millions of people in tropical countries, even though it only provides carbohydrate food value and is low in protein and vitamins. Tapioca can be used as a thickening agent in various manufactured foods.

Production Process: Cassava Roots to Tapioca

- 1. Harvesting the roots:** Cassava is harvested manually by raising the lower part of the stem. The roots are pulled out of the ground and then removed from the base of the plant. The most oversized tubers of each plant are taken out which the remaining tubers are left to fatten. Leaves in the upper part of the plant are plucked before harvest. The harvested cassava roots are sorted and weighed to select wholesome products for processing.
- 2. Preparing the roots:** All cassava roots are peeled and grated before going into the central processing unit. A smooth paste is made of the peeled roots to ensure that the extraction process is quicker and more comfortable.
- 3. Extraction process:** The mash is discharged into a starch extractor to extract the starch and leave a starch milk residue. The starch milk is allowed to settle which forms top layers. The first and top layer is the free supernatant liquid followed by the thick starch slurry. The supernatant layer of fluid is removed by siphoning off the liquid with a rubber hose. The thick slurry obtained is dewatered to reduce its moisture content by the vacuum dewatering machine.
- 4. Drying:** The dewatered slurry is dried and turned into a further mechanically reduced cake to get granules. The granulated cake is mechanically dried in a mechanical dryer to reduce its moisture content to about 8 – 10%. The dried product is milled to desired particle size according to the need of the final buyer.
- 5. Processed:** Commercially, the starch is processed into several forms: hot soluble powder, meal, pre-cooked fine/coarse flakes, rectangular sticks, and spherical. Pearls are the most widely available shape; sizes range from about 1 mm to 8 mm in diameter, with 2–3 mm being the most common. All flakes, sticks, and pearls must be soaked well by the end-user before cooking to rehydrate, absorbing water up to twice their volume.

Chart 1. Cassava starch production process.

Chart 1. Source: [Cassavabiz](https://www.cassavabiz.com)

Industrial Applications

Tapioca starch has various industrial and commercial applications ranging from paper, textile, food to the furnishings industry.

- **Textile Industry:** Tapioca starch is used in the textile industry in various processes. In yarn sizing, the starch is applied to coat the yarns to obtain glossy and smooth threads. It is also used as a lubricant in preventing the single strings from disintegrating during in-line loom weaving. It is also used in printing cloth more even while printing.
- **Paper Industry:** After extracting the pulp from pine, bamboo and eucalyptus wood it needs to be processed. The sheets are coated

with starch to get a smoother surface and paper. The tapioca starch solution increases the sheet surface's smoothness and fills up the sheets' pores, making the sheet harder for ink or color to penetrate. Besides, adhesive in the starch remaining in the finished paper increases the paper's strength.

- **Glue Industry:** When tapioca is heated or exposed to chemicals, it becomes high in viscosity and stays sticky and stable over a long time. Pure tapioca starch with low acid levels called dextrin is used to make glues.

The Biofuel Industry Applications

Figure 1. Cassava starch value chain for biofuel industry.

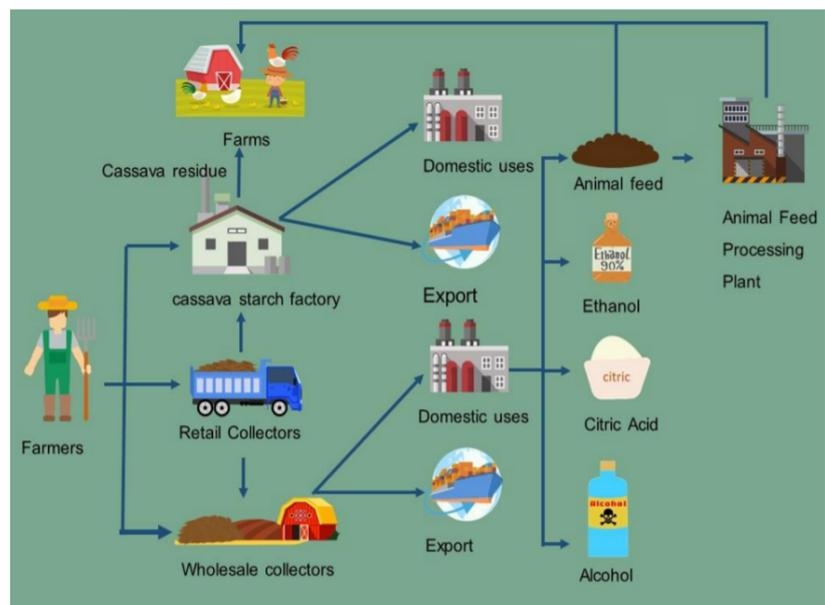


Figure 1. Source: ASEAN Food Security Information System

Thailand is one of the major cassava starch producing countries globally with a high expertise in the processing of raw cassava into starch that can be used as raw material for the production of biofuels such as citric acid, ethanol and alcohol. The total cassava outputs are exported mostly to China in the form of starch (99%) and pellet (1%). The 2 main varieties of cassava in Thailand can be categorized into sweet and bitter cassava.

Sweet cassava is rarely mass cultivated, due to very small and limited demand. It also has trace amounts of cyanide contents with little to almost no application in the food processing or biofuel industry and is

used mainly as a cooking ingredient.

Bitter Cassava on the other hand is the highly exported variety, characterized by high quantities of cyanide compound making it unsuitable for human consumption but highly valuable for industrial processing into cassava starch, chips, pellets for their various industrial applications. Starch is a raw material in the processing of ethanol.

Food and Beverage Applications

Tapioca has a neutral flavor and strong gelling power, making it an effective thickening agent in the food and beverage industry. Tapioca is non-gluten, non-GMO and non-allergenic ingredients. Tapioca is a common ingredient in gluten-free products because it helps lighten the texture and maintain moisture in the absence of gluten.

- Tapioca is used in sweetened as well as in unsweetened bakery products. It is used in many confectioneries as thickeners, gelling agents, foam strengthening, and film foaming and glazing.
- Tapioca is used in the manufacturing of monosodium glutamate (MSG) in various Latin American countries.
- Traditional uses for tapioca include tapioca pudding, bubble or boba tea, and other candies and desserts. Both tapioca pudding and boba tea are made with pearled tapioca, or small balls of tapioca starch that turn into a chewy, gummy ball when cooked.
- Tapioca adds body to soups, sauces, and gravies. It has more thickening power and generally costs less than flour and other thickeners.

Part II

Global Market Dynamics

2.1 Production and Consumption

2.2 Tapioca Trade

Global Market Dynamics

Production and Consumption

Tapioca is extracted from the cassava plant roots found in equatorial regions of the world. In 2019, 303M MT of cassava was produced, out of which the top 5 producing countries produced 56%. The production of cassava plants is dominated by Nigeria (19%), the Democratic Republic of the Congo (13%), Thailand (10%), Ghana (7%), and Brazil (6%). The crop can grow well in poor soils and can withstand drought making it an ideal crop to cultivate in places where other crops struggle.

Even though Nigeria is one of the top cassava producers, its ability to process cassava is minimal. The third-largest producer Thailand, however, processes the vast majority of the root. It is more of a cash crop in the region than a staple. Processing offers not just the ability to produce higher-value, exportable cassava-derived items like tapioca.

Thailand is the largest producer of tapioca starch, with a capacity of over 2M MT per year. The country has the most advanced production technology and the Thai tapioca starch is known for its high quality at competitive prices. Following Thailand is Brazil, Nigeria, and Indonesia as the top tapioca producing countries.

More than half a billion people worldwide depend on cassava as a primary food source and are commonly called “the bread of tropics.” Most of the consumption is concentrated in tropical countries across Africa, Asia, and Latin America. It is the third-largest source of calories after rice and corn in these regions.

Tapioca Trade

Exports

In 2020, a total of 5.1M MT tapioca was exported in the world with Thailand, Vietnam, Laos, Indonesia and Cambodia being the leading tapioca exporters in terms of volume. Thailand and Vietnam dominated tapioca exports with a total share of 96% in the exported volume. In terms of value, tapioca worth USD 2.2 billion was exported in 2020, in which Thailand had a share of 53%. Following Thailand is Vietnam with a share of 40% in the global export value, Cambodia with 2% and Indonesia with a small percentage of 1.4%.

Among the major exporting countries, Thailand is the most highly specialized exporter of cassava starch almost exclusively for the industrial

industry of China owns 60~70% of the total Thai cassava starch exports volume. Given that the export share of China is overwhelmingly large, the industry can be at risk in the event that the importer forfeits their commitment as what occurred in 2016.

China experienced a continuous high production and exceedingly low prices of domestic maize. Maize is an almost equally efficient substitute for tapioca starch as a raw material for ethanol processing. Normally, maize's demand in the industrial feed industry is higher. As a result, the majority of the ethanol industries in China significantly reduced their imports of cassava from Thailand. Those that continue to import, imposed very unprofitable prices from Thai exporters. 2017 export values dropped.

Low import demand and export prices caused farmers to suffer from major capital losses and many shifted to other more profitable crops such as sugarcane and maize, the year was also marked by incessant rains that caused backlogging and many crops were damaged. Lack of capital and any motivation to take care of their cassava crops left high volumes of cassava crops to wilt and rot.

Imports

China was one of the leading tapioca importing countries in 2020, with a share of 69% in the total value of tapioca imports. China alone imported 2.8M MT of tapioca, followed by Taiwan (281K MT) and Indonesia (149K MT). Following Indonesia were Malaysia and Japan. Cumulatively, the top five tapioca importing countries held about 86% in the total value of tapioca imports.

The demand from China is greatly influenced by domestic policies for grains particularly for maize which has the exact same applications in the same industries that utilizes cassava (animal feeds, ethanol, alcohol, food industries).

In January-May 2021, the value of China's tapioca imports increased 37.1% YoY to USD 722.7 million

Part III

Recent Developments in Major Producing and Trading Regions

3.1 Thailand

3.2 Vietnam

Recent Developments in Major Producing and Trading Regions

Thailand

- Since 2018 tapioca business operators in Thailand have been asking the government to speed up the rehabilitation and the cassava mosaic disease process that has ravaged the farmers' produce. The disease has now affected about 70,000 rai (11.2K ha) in 18 provinces.
- The disease has also impacted tapioca starch production, which is extracted from cassava roots.
- Thailand exported 2% less tapioca in 2020 compared to the volume recorded in 2019.
- In Q1-Q3 2021, the tapioca export from Thailand increased 35% compared to the volume of 2020 during the same period.
- In Q1-Q3 2021, YoY growth of tapioca export volumes to China was 58%, Taiwan 21% and Indonesia -68%.
- The production of cassava in Thailand in 2021 is reported to have increased 6.43% to 30.86M MT, due to higher harvested acreage yield and increased use of fertilizer..
- For 2022, the forecasted volume cassava production is 32.16M MT representing a 4.20% increase compared to 2021 as 5,936 additional hectares have been planted with cassava.
- Between January and April 2021, the average FOB price of cassava starch from Thailand was USD 447 per MT. For the full year of 2020, the average price was 441.

Chart 2. Thailand Tapioca Export.

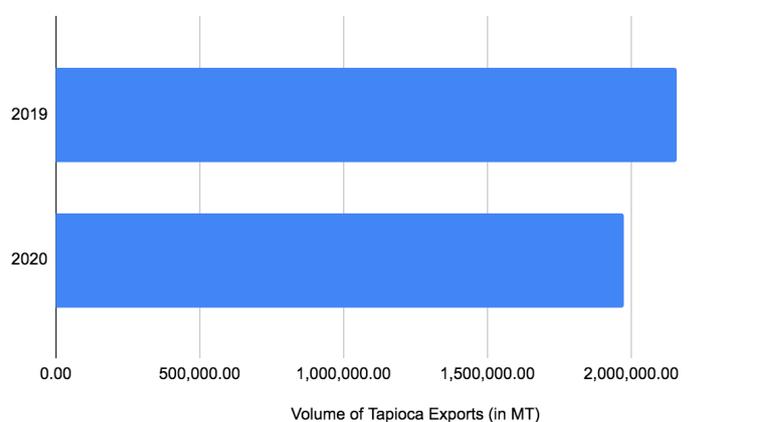


Chart 2. Source: Trademap.
HS Code: 110814.

Chart 3. Tapioca Price.

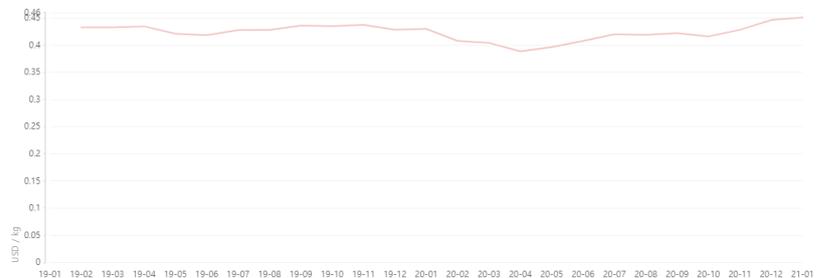


Chart 3. Source: Tridge, Price Data

- According to price data by tridge, prices have gradually increased between 2019 - 2021. In January 2019 and 2020, the price of one kg tapioca was USD 0.43 which increased to USD 0.45 in 2021. Tapioca prices are expected to rise in February 2021 because of widespread drought, which has reduced production by 30% in Thailand and its neighboring countries.

Vietnam

Production

- Competition between Thailand and Vietnam in the Chinese tapioca market is growing. The preference for Thai tapioca remains high but competitive pricing and Vietnam's proximity to China are significant advantages for the Vietnamese, especially considering the current sea freight situation with high freight costs and shortage of available containers.
- About 21M MT of cassava starch were exported from Vietnam in 2020. The exports were worth about USD 866M.
- China is Vietnam's largest tapioca export market with a 94.5% share of export value, followed by Taiwan (1,9%) and Malaysia (1.2%)
- In 2020, the FOB price of cassava products from Vietnam averaged USD 360 per ton
- Between January and April 2021, the FOB price of Vietnamese cassava products averaged USD 447 per MT.
- From January-May 2021, Vietnam exported tapioca starch worth USD 102.6 million down 52.6% YoY.
- Vietnam's share of China's tapioca import value in January-May fell considerably to 14.2% in 2021 from 41% in 2020.

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