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How Indonesian Coconut Oil Competes in China: La/Aids Model Approach

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Abstract
Coconut oil is a promising commodity for Indonesia, with increasing global demand in the last decade. Indonesia must take advantage of this moment by increasing its competitiveness. This study aims to analyze the competitiveness of coconut oil exports relative to rival products in the Chinese market. The research uses secondary data from 1993 to 2022 and is analyzed using the LA/AIDS demand model. The findings indicate that Indonesian coconut oil has a 50% demand share and is the highest in the Chinese market. The elasticity of expenditure is 1.58 (E > 1), indicating it is elastic and of the best quality. According to the own-price elasticity, Indonesian coconut oil is negative (-1.532), so it is elastic and experiences a decrease in demand when the price increases. Meanwhile, the cross-price elasticity is positive, indicating that the relationship between Indonesian and Philippine coconut oil is substitutive or competitive. Indonesia and Malaysia show a complementary relationship. However, when viewed in reverse, it shows a substitution relationship. Based on this analysis, Indonesia has the opportunity to control the coconut oil trade in the Chinese market and potentially in other markets if it can optimize its competitiveness.

Keywords: Coconut oil; demand analysis; export; LA/AIDS

Introduction

Indonesia ranked first in world coconut production with average of 17 million tons per year from 2017 to 2021 (FAOSTAT, 2024). Indonesia has the highest coconut producing country, followed by the Philippines (average of 14.7 million tons per year) and India (average of 14.5 million tons per year). Compared to primary coconut products, the development of global market demand for processed coconut derivatives products dominates both volume and export value. The growth of volume and export value of Indonesian primary coconuts in 2020-2021 respectively was 3.73% and 43.57%, while for processed coconut products were 4.07% and 45.47% respectively (BPS, 2021). Tthis opportunity should be a projection for Indonesia for the development of coconut derivative products and capitalize on such opportunities, seeing the trend in demand in international markets that continue to increase (Astuti & Paksi, 2022).

As a supplier country, Indonesia needs to look at the potential export of coconut oil from two sides, namely market demand and price. From the demand side, the world's coconut oil consumption is estimated to reach 4.3 million tons in 2040 (Barthel et al., 2018). Some of the reasons are the results of various research and new methods of extraction of coconut oil that are easy to obtain, functional, higher quality, and less competitive with staple food (Astuti & Axis, 2022; Aulia et al., 2020). Coconut oil is

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considered one of the most stable oils, has a strong resistance to rancid oxidation, and the ability to survive at higher temperatures compared to other oils (Alice et al., 2006). This reason implies increasing awareness of health factors, as well as environmental issues (Apraku & Ayisi, 2017; do Rosário Ximenes et al., 2021).

Meanwhile, on the price side, coconut oil tends to fluctuate but shows positive trends during 2019-2024 as shown in Figure 1. When compared to palm oil prices, coconut oil tends to be higher with price growth of 2% per year while palm oil has a price growth of 1% per year (IndexMunsi, 2024). Data and research show that there is a phenomenon of shifting palm oil consumption to coconut oil (Pratama et al., 2023) in some countries such as the US and European markets (do Rosário Ximenes et al., 2021; Grimhardt, et al., 2015). The growing trend of coconut oil demand and sharp price growth compared to palm oil shows that the global palm oil market is very promising.

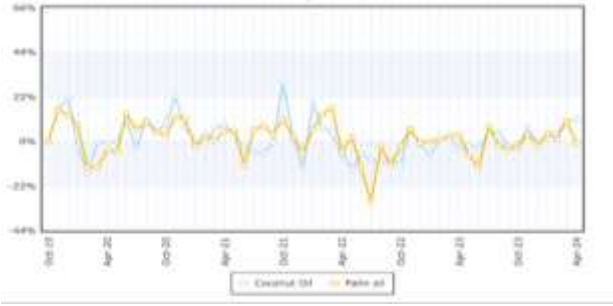


Figure 1. Growth of Coconut Oil and Palm Oil

Source: IndexMundi (2024)

China is still the main country with the highest demand for Indonesian coconut primary products with HS 080112 (BPS, 2021). Based on UNComtrade 2024 data, China's primary coconut demand in 2021 amounted to 872,000 tons. China imported from Indonesia at 44% and became the highest supplier, followed by Thailand at 38.30% and Philippines at 2.86%. However, China's market conditions seem to shift in 2020-2022, where demand in the form of coconut oil (HS code 151311) is higher than that of primary coconut. Data shows that China's primary coconut import volume from 2020-2022 increased by 9.7% per year, while import volume of coconut oil increased sharply by 17.5% per year (FAOSTAT, 2024). However, the Philippine dominance is still high, which is 14.6% of China's coconut oil needs (FAOSTAT, 2024). This opportunity has not been optimally utilized by Indonesia which only supplies 0.23% of the needs of Chinese coconut oil.

China as an "emerging market" country has long been a strategic market for exporting Indonesian products. The existence of bilateral cooperation with China, namely Bilateral Economic and Trade Cooperation (BETC), increases the chances of increasing trade activity (Izzatin et al., 2023; Pinto et al., 2022). Based on research, the existence of a trade agreement makes Indonesia export to China greater (H. Make, 2016). This is supported by previous research, share and growth of coconut oil products in China higher than South Korea and USA (Anggrasari et al., 2023; Astuti & Axis, 2022). It is supported by the competitiveness of Indonesian coconut oil in China which shows higher than the Philippines and Malaysia (Purba et al., 2021). This condition should be optimized for Indonesia, although it will face a huge and complex challenge.

Free Trade is also a contributor to the challenge as it opens up opportunities for other coconut oil exporters to seize China's market share. FAOSTAT 2024 data shows that the highest contributors of coconut oil in China are Indonesia (2%), followed by the Philippines (1%), and Malaysia (0.34%). In

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fact, increasingly tight competition impacts Indonesia's competitiveness fluctuating due to the influx of other beginner producers in the international market (Sukmaya et al., 2018) and able to shift Indonesia's market share. Another cause is the decrease in the price of coconut oil in the Philippines which makes demand increase. Plus the price of substitution goods coconut oil can also lead to decreased competitiveness (Anggrasari et al., 2023). Therefore, it is important for Indonesia to track the demand for coconut oil in the Chinese market which also sees competitiveness with competitors. This will help formulate the right plans by government agencies and related policymakers to increase coconut oil production to meet demand and benefit the country's economy.

Based on the above description, research on the competitiveness of Indonesian coconut oil in the Chinese market is very important. The study offers insights and discussions on the demand for Indonesian coconut oil and how its competitiveness is compared to the Philippines and Malaysia, the top exporter of coconut oil in the Chinese market. This analysis will have a significant economic impact due to the potential of Indonesian coconut oil that can serve as a support for the country's economic benefits. The government can consider Indonesian coconut oil as one of the strategic commodities and decide on a profitable policy strategy.

Literature Review

Aulia et al. (2020) explores the evolution of coconut oil exports from Indonesia, Philippines and Malaysia in the global market between 2001 and 2017. The study analyzed the comparative competitiveness of coconut oil using the Revealed Comparative Advantage (RCA), Acceleration Ratio (AR), Trade Specialization Index (TSI), and Export Similarity Index (ESI). Research findings show that Indonesian coconut oil is highly competitive and has experienced the most significant increase in the growth of crude coconut oil exports compared to the Philippines and Malaysia. In contrast, Indonesia and the Philippines show greater similarities in the coconut oil market than Indonesia and Malaysia. Compared to Aulia et. al (2020), the research conducted has a newness focusing on the competitiveness of Indonesian coconut oil using the Linear Approximation Almost Ideal Demand System (LA/AIDS) demand function. Through budget share value, Indonesia's coconut oil competitiveness will be evaluated with its competitors, namely the Philippines and Malaysia during the observation period 1993-2022. The competitiveness of the competition will be further known through the value of the elasticity of the production, its own price, and cross price. So through research with the LA/AIDS model aims to find out how Indonesia's coconut oil competitiveness has competitiveness through its demand share and how price variables affect its demand in the Chinese market. Some studies that have used LA/AIDS include:

Author	Research Title	Result
Fortunika et al. (2021)	Positioning of Indonesian Robusta Coffee in the German Market Using the Linear Approximate Almost Ideal Demand System	The results indicate a relationship between coffee from the three countries, either substitutive or complementary. This relationship can be determined from the cross-price elasticity values.
L. Zin (2022)	Demand Analysis of Vietnamese Coffee in the U.S.	The price elasticity value shows that price changes can affect the relationship between commodities from each

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		competing country and the amount of demand.
Pinto et al. (2022)	Indonesian Clove Export Performance in the Indian Market: A Linear Approximate Almost Ideal Demand System (LA/AIDS) Approach	The change in clove prices caused India's clove demand to switch to Madagascar and Comoros
Mufeeth et al. (2021)	Estimation of Demand for Coconut in Sri Lanka: An Application of Almost Ideal Demand System	The elasticity value can indicate that coconut is an essential commodity in Sri Lanka.

The first demand estimate model of Almost Ideal Demand System was introduced by Deaton and Muellbauer (1980). The purpose is to assess the demand system according to the demand theory. The AIDS model offers benefits over previous demand systems models such as linear production systems, Rotterdam models, and Translog models. First, AIDS serves as the first order estimate for each request system. Second, AIDS adheres to the principle of consumer choice in demand theory, meeting the requirements of homogeneity, symmetry, and summation. Lastly, the functional form of AIDS is aligned with consumer budget data.

Research Method

The data used are time series from 1993 to 2022 consisting of coconut oil price data, import volume, import value, and coconut oil production. China was chosen as a research object, arguing that China is the largest importer of coconut oil for Indonesia. The Philippines and Malaysia are chosen as competing countries for coconut oil as it is China's largest supplier of coconut oil. Furthermore, the price variable is calculated by taking the total import value and dividing it by the import amount in the importing country (China) from the exporting country (Indonesia, the Philippines, and Malaysia). Data is obtained from FAOSTAT, UNComtrade, and BPS.

The study was analyzed using the Linear Approximation Almost Ideal Demand System (LA/AIDS) request model used to obtain coconut oil demand information from Indonesia, the Philippines and Malaysia in the Chinese market. The LA/AIDS model will also show the results of how the exporting countries compete with each other through cross-price values. The value of price elasticity will describe the nature of the product, whether it is a substitution or complementary item. This model of standard AIDS is developed because the price index is non-linear and difficult for researchers. So Deaton and Muallbauer suggest the use of the Stone Price Index (Amzul Rifin, 2010; do Rosário Ximenes et al., 2021). The use of the Stone Price Index on the basic model of AIDS becomes the Nearly Ideal Aproximation Linear Request System (LA/AIDS), with the following equations:

$$w_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \ln(P_j) + \beta_i \ln\left(\frac{x}{p*}\right) + \varepsilon_t$$

Where n; the number of commodity categories considered in the whole system; the budget portion for coconut oil from the exporting country, Pj; the price of coconut oil from each exporting country, α, β, and γ; the parameters to be estimated, X; expenditure, P*; the Stone Price Index, and ε ; error/error. The LA/AIDS model is used as an empirical assessment for each exporting country (Indonesia, Philippines, and Malaysia) to importing countries (China). And here are the formulas for the Stone Price Index:

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$$lnP = \sum iw_i lnP_1$$

In this study, the market share of coconut oil from Indonesia, Philippines and Malaysia serves as dependent variables in each equation. On the other hand, independent variables include the prices of coconut oil, as well as the production of Chinese coconut oil from the three exporting countries. The following are models of LA/AIDS equations from three exporting countries:

$$w_1 = \alpha_1 + \gamma_1 \ln P_1 + \gamma_2 \ln P_2 + \gamma_3 \ln P_3 + \beta_1 \ln(\frac{x}{p^*}) + \varepsilon_1$$
$$w_2 = \alpha_2 + \gamma_4 \ln P_1 + \gamma_5 \ln P_2 + \gamma_6 \ln P_3 + \beta_2 \ln(\frac{x}{p^*}) + \varepsilon_2$$
$$w_3 = \alpha_3 + \gamma_7 \ln P_1 + \gamma_8 \ln P_2 + \gamma_9 \ln P_3 + \beta_3 \ln(\frac{x}{p^*}) + \varepsilon_3$$

Information :

w_1 = import share of Indonesian coconut oil

w_2 = import share of Philippines coconut oil

w_3 = import share of Malaysian coconut oil

P_1 = import Price of Indonesian coconut oil

P_2 = import Price of Phillipines coconut oil

P_3 = import Price of Malaysian coconut oil

α,β,γ = regression parameters

ε = error term

The regression coefficient on the model uses the Seemingly Unrelated Regression (SUR) created by Deaton and Muellbauer (1980). The advantage of this method is the first order approximation on the request system. The SUR method can qualify for summation, homogeneity and symmetry that are conditioned in demand theory, as well as have the type of function that corresponds to consumer budget information (Widarjono, 2018). Furthermore, the SUR method processed in the STATA 17.0 program is performed to determine the regression coefficient in the model. In accordance with the requirements in the AIDS model that must meet the limitations, here are three limitations that must be met in the demand theory, including:

1. Adding-Up

Scenarios showing total expenses on demand function according to total revenue.

$$\sum_{i=1}^{n} \alpha_1 = 1, \sum_{i=1}^{n} \gamma_{ij} = 0, \sum_{i=1}^{n} \beta_i = 0$$

2. Homogeneity

The principle that shows that if revenue and prices vary in the same size, the demand for a product remains constant.

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$$\sum_{i=1}^{n} \gamma_{ij} = 0$$

3. Symmetry.

This indicates that the reduction in cross-demand prices is balanced.

$$\gamma_{ij} = \gamma_{ij}$$

In this study, uncompensated elasticity (Marshallian) is used to calculate the elasticity of its own price and cross price, and the elasticity of the expenditure will also be calculated. Uncompensated Elasticity (Marshallian) accommodates the substitution effect and income effect due to price changes. The three elasticities are determined based on research from (Alnafissa & Alderiny, 2020; Halti et al., 2020; do Rosário Ximenes et al., 2021; L. R. E. Malau et al., 2022; Malla et al., 2020; Ulubasoglu et al., 2016). The third formula of elasticity can be written as:

1. Expenditure Elasticity

$$n_i = 1 + \frac{\beta_i}{w_i}$$

2. Own-Price Elasticity

$$e_{ij} = \left(\frac{\gamma_{ij} - \beta_i w_i}{w_i}\right) - 1$$

3. Cross-Price Elasticity

$$e_{ij} = \frac{\gamma_{ij}}{w_i} - \beta_i \left(\frac{w_j}{w_i}\right); i \neq j$$

Where :

γ_{ij} = parameters of coconut oil prices in the Chinese market

β_{ij} = total import value of coconut oil in the Chinese market

w_i = Indonesia's coconut oil share

w_j = competing country's coconut oil share

Results and Discussion

The Chinese market has long been a coconut export destination for Indonesia. Over time, it is seen that the need for coconut products that have been processed in the Chinese market has shifted to processed coconut products namely coconut oil (Grimhardt, 2015). China occupies second place in the world based on demand for coconut oil. This opportunity can be utilized by Indonesia because coconut oil is a vital commodity for Indonesia and has considerable potential for foreign exchange compared to other coconut processed goods. This shows in 2021, Indonesia's coconut oil share to China is 0.23% of total Chinese imports with a value of 22,000 USD (Grimhardt, 2015). Based on the results of the analysis of LA/AIDS in this study, the share of Indonesian imports compared to the Philippines and Malaysia in the Chinese market during the 1993-2022 research period was shown in Table 1.

Table 1. Coconut Oil Share in China (1993-2022)

Exporting Countries	Average Share

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Indonesia	50
Philippines	25
Malaysia	7

Source : FAOSTAT Data Processed, 2024

Over 30 years of observation, Indonesia's coconut oil share is the largest compared to the Philippines and Malaysia, accounting for 50% of the total imports of coconut oil in the Chinese market. This puts Indonesia in the first position. In second place there is the Philippines with a share of 25%. Meanwhile, Malaysia has the smallest share of 7%. This shows that Indonesian coconut oil dominated the Chinese market during the 30-year observation period (1993-2022). The findings are in line with Purba et al. (2021), that Indonesian coconut oil is highly competitive in the Chinese market compared to other markets such as South Korea and the United States. The competition landscape in certain export markets can shift (fastly) as new countries join the competition. As a result, Indonesia's capacity to maintain and improve its competitive advantage, especially in meeting diverse export standards, is essential for its growth and ability to quickly adapt to changes in global markets. In addition, Indonesia's palm oil exports to China are expected to be more competitive due to favorable export prices and growing demand for coconut oil products (Xia & Dewi, 2022; Yulhar & Darwanto, 2019).

Expenditure Elasticity

The value can indicate the nature of an item, whether it includes normal, luxurious, or inferior goods (Rifin, 2013; Sari Br Surbakti et al., 2024). According to Table 2, the elasticity of coconut oil production from Indonesia and Philippines is positive, means that coconut oil from these countries includes normal goods. The increase in total import value in China by 1% will lead to a rise in Indonesia's coconut oil demand by 1.58% and a rise in Philippine coconut oil demand by 0.869%. This is in line with the findings of Ximenes et al. (2022) which also states that the elasticity of crude coconut oil from Indonesia and the Philippines is positive, which confirms its status as a normal item in the market. In contrast, the elasticity of spending for Malaysia is negative, which indicates that coconut oil from Malaysia includes inferior goods (Pinto et al., 2022; Salsabila et al., 2023). Thus, a 1% increase in total import value of China will lower Malaysian palm oil demand by 0.143%.

Table 2. Expenditure Elasticity for Coconut Oil from Indonesia,

Philippines, and Malaysia in China

Exporting countries	**Expenditure Elasticity**
Indonesia	1.5888
Philippines	0.869
Malaysia	-0.143

Source: FAOSTAT Data Processed, (2024)

The expenditure elasticity of coconut oil from Indonesia is elastic because it is greater than 1 (E>1). Meanwhile, coconut oil from Philippines and Malaysia shows less than 1 (E<1) which means inelastic. It means that coconut oil from Indonesia is more responsive to price changes. This conclusion is supported by research conducted by Surbakti et al (2024), the expenditure elasticity more than 1 (E>1) shows better quality compared to competitors. Thus, Indonesian coconut oil shows the highest value of

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1.5888 which means if total expenditure of Chinese coconut oil imports increases, the needs of Indonesian coconut oil are expected to rise more than the Philippines and Malaysia (Wisnujati, 2020).

The conclusion that can be drawn from the expenditure elasticity is that Indonesia coconut oil has superior quality compared to Philippine and Malaysian coconut oil. It is in accordance with Tomek & Robinson (1990) which states that higher quality commodities generally have higher expenditure elasticity. Seeing the trend of increasing coconut oil exports continues to increase as market demand for composition requirements (Mufeeth et al., 2021; Nde et al., 2014). Indonesia must be able to maintain and continue to innovate to improve the quality of coconut oil products in order to meet the needs of Chinese and world coconut oil.

Own-Price Elasticity

Table 3 shows that the own-price elasticity of Indonesia's palm oil is measured by -1,432, which shows that the increase in Indonesia's coconut oil price by 1 percent will lead to a decrease in demand from China by 1,432 percent. Indonesia's own price elasticity value is considered because its absolute value is more than 1, which means sensitive to price changes. This condition occurs due to the instability of Indonesia's coconut oil industry in obtaining basic ingredients. The price of raw materials in the form of coconut meat has increased, resulting in the increase in the cost of coconut oil (Ximenes et al., 2021).

Table 3. The Own-Price Elasticity of Coconut Oil

Exporting Countries	Uncompensated Price Elasticity
Indonesia	-1.532
Philippines	-1.544
Malaysia	-0.836

Source: FAOSTAT Data Processed, 2024

The Philippines' own-price elasticity is the largest, which is -1,544 which means the Philippines' coconut oil price is elastic. Negative sign means if Philippine coconut oil prices rise, it will lower the demand for coconut oil by 1,544. With the highest elasticity value, it shows that Philippines has a high level of sensitivity to price changes. As the value of price elasticity gets higher, the higher the response to the change in prices of the country's goods (Fortunika et al., 2021; Sari Br Surbakti et al., 2024). Malaysia is ranked third with a value of -0.836 which is inelastic. Negative sign means that if Malaysia's coconut oil price rises by 1 percent, it will lower its demand by 0.836 percent. Malaysia has the lowest price elasticity, so it is not too responsive to Chinese coconut oil demand. This is in accordance with the findings of Pinto et. al (2022), Malaysia is known as a relatively new coconut oil exporter country in the Chinese market and still focuses on coconut oil production (Aulia et al., 2020). In addition, the study says Malaysia is an importing country of crude coconut oil with a demand of 2% of the world's total demand for re-exporting countries (Yulhar & Darwanto, 2019). Despite being a new exporter country, Malaysia has demonstrated its potential by successfully becoming one of the reliable suppliers of coconut oil for the Chinese market.

Based on the value of its own-price elasticity, coconut oil from Indonesia, the Philippines and Malaysia shows negative signs that correspond to demand theory. This indicates that the increase in coconut oil prices will result in a decrease in demand (Variants, 2014; Walter & Snyder, 2007). The Chinese market is very open to Indonesian coconut oil exports, but Indonesia's coconut oil share continues to decline. Research Anggrasari et. al (2023) found that this could be caused among others by the increasingly

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strong competitiveness of the Philippines and the price of coconut oil market as an alternative. There is still an opportunity for Indonesia, to create an approach that supports farmers and coconut industry related to foreign exchange flow (Ximenes et al., 2022) so that it can maintain the sustainability of coconut oil production efficiently.

Cross-Price Elasticity

Cross-price elasticity assesses how coconut oil demand in a country change in response to variations in coconut oil prices from competing countries. This elasticity also describes the relationship between products from two or more competing countries and shows whether the product is substitutional or complementary (Heiyon, 2022).

Table 4. Cross-Price Elasticity of Coconut Oil

Exporting Countries	**Cross-Price Elasticity**		
	Indonesia	Philippines	Malaysia
Indonesia		0.078	-0.145
Philippines	0.534		0.140
Malaysia	0.581	0.398	

Source: FAOSTAT Data Processed, 2024

Cross-price elasticity of Indonesian and Philippine coconut oil is less than 1 (<1) which means inelastic. A positive sign means that the relationship between Indonesia and the Philippines is substitutional. That is, when Indonesian coconut oil experienced a 1% increase in price, it impacted the increase in Philippine coconut oil demand by 0.078% in the Chinese market. This is also true, on the contrary, when the price of coconut oil from the Philippines rose by 1%, then the demand for Indonesian coconut oil in the Chinese market rose by 0.581%. This observation is in line with the research conducted by Manalu et al. (2020), Surbakti et al. (2024), and Ximenet et al. (2022) showing that variations in prices of goods in one country can benefit its competitors. In this scenario, if the price of coconut oil from Philippines rises, China will likely switch to import coconut oil from Indonesia, and vice versa. Nevertheless, it is clear from the change in demand that the percentage of Indonesia's coconut oil increase is more significant than that of Philippines when both countries experience an increase in coconut oil prices. This indicates that Indonesian coconut oil is positioned better than Philippine coconut oil in the Chinese market.

In addition, the cross-price elasticity between Indonesia and Malaysia shows a value of less than one (<1) which means inelastic. Negative marks meaning Indonesian and Malaysian coconut oil are complementary products. If Indonesia's coconut oil price rises by 1%, then Malaysian coconut oil demand drops by 0.145%. However, the value of Malaysia's cross-price elasticity against Indonesia shows positive results which means that Malaysian coconut oil is a substitution of Indonesian coconut oil. If Malaysian coconut oil prices rise by 1%, Indonesia's coconut oil demand grows by 0.581%. This condition indicates that Indonesian and Malaysian coconut oil does not have competitive relationships. Aulia et. al (2020) found that this is because Malaysia is still in the early stages of exporting coconut oil and even tends to be an importing country.

Competition between Indonesian and Philippine coconut oil has been studied by Boardi et al (2019); Pratama et al (2023); Ximenes et al (2021), the increase in coconut oil exports from Philippines will

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significantly affect the decrease in coconut oil exports from Indonesia. Philippines holds significant market power due to government coconut levy funds, which are further enhanced by the establishment of the Coconut Farmers Trust Fund in 2011. The Fund is created to promote the growth of Philippine coconut sector through a program that provides financing and support for coconut farmers aimed at increasing productivity and supporting coconut-based companies. Managed by the Coconut Industry Development Council (CIDC), Philippine coconut levy fund is designed to ensure benefits for small coconut farmers, especially by advancing farmers-led initiatives that focus on improving productivity and encouraging cohesive development of the coconut industry. This government-proactive involvement allows the Philippines to strengthen its position in the global coconut oil market.

Malaysia as a potential competitor of Indonesia is also increasingly showing its development. According to Yulhar et. al (2019), the Malaysian government invested in coconut commodities and this is seen from a significant increase in Malaysian coconut oil production during 1996-2014 by 588.7 tons per year. This continued to increase Malaysia's coconut oil exports during 1996-2017. Through this program, Malaysia managed to shift Indonesian coconut oil to the Singapore market and became a major supplier by controlling 80% of Singapore's coconut oil share. Further research by Anggrasari et. al (2023) found that Malaysia is the destination for Indonesian coconut oil export and is a re-export country (Aulia et al., 2020). This indicates that Malaysia reprocesses coconut oil imported from Indonesia and exports it back to any potential market.

Based on both competing countries, the role of the government is crucial in the success of increasing the competitiveness of coconut oil through increased production and support of funds for producers. Price factors play an important role in affecting Indonesia's coconut oil competitiveness level, with competitive prices can increase export volume (Manalu et al., 2022). Some studies have found that coconut oil production has a significant effect on the amount of exports (Barthel et al., 2018; Pratama et al., 2024).

Research conducted by Datang et al. (2019) shows that poor agricultural practices and inadequate government assistance are one of the problems that cause low yields. Other factors that affect the low levels of coconut production are limited land ownership, labor shortages, high labor costs, over-crowded factories with capacity of more than 200 plants per ha and inadequate management strategies, and significant disease and insect attacks. Therefore, to get the best price, production and technology efficiency efforts are required. Ironically, the area of coconut plantation in Indonesia is still low (Alouw & Wulandari, 2020) and continues to decline annually (Xia & Dewi, 2022). In 2011-2020, there was a 10% drop from 3,767.7 thousand ha to 3,396.8 thousand ha. The Government of Indonesia needs to intensify integrated policy instruments for coconut production, especially the allocation of consistent funding mechanisms for local coconut farmers, such as in the Philippines, to maintain production quality and cost efficiency so that market price competitiveness can be better.

Anggrasari et al (2023) recommends increasing human resource capacity, namely coconut farmers. The coconut sector also requires investment incentives for copra and coconut oil, as well as appropriate production technology to increase domestic coconut oil production. As noted by Alouw & Wulandari (2020), the Indonesian government has undertaken initiatives that include identification and marking of high-quality coconut parent trees for superior planting materials, development of tissue and embryo culture techniques, promotion of good agricultural practices, and the introduction of high-value crops in coconut plantations to increase revenue for small-scale farmers.

Efforts to improve coconut yield include: (1) distributing certified seeds to promote re-planting and adoption of superior varieties officially released certified by the Ministry of Agriculture; (2) creating seed gardens to provide quality planting materials; (3) advocating good agricultural practices; (4)

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managing significant pests and diseases; and (5) developing tissue and embryo culture methods. Providing farmers with high quality coconut seeds is considered important, because optimal potential can only be realized with proper planting materials. With strong commitment between governments, industry and farmers to increase coconut oil production, it is expected that Indonesia can control the market. This is very important and crucial because based on trends indicates that by 2030 coconut products and derivatives will grow rapidly (Zainol et al., 2023). Alouw & Wulandari also recommends that the Government prioritize sustainable coconut development as a major national initiative to meet demand, increase the spread of innovative technology among farmers, improve small-scale farmers' capabilities, promote local consumption of coconut products, grow the number of manufacturing industries in key coconut producing regions to create sellable and profitable coconut products, and strengthen collaboration between farmers and industry.

Conclusion

Based on the results, Indonesian coconut oil has strong competitiveness in the Chinese market during 30-year observation period (1993-2022) by gaining a share of 50% of the total imports of Chinese coconut oil. Based on the value of price elasticity, Indonesian coconut oil production is elastic, meaning it is more responsive to price changes. Meanwhile, coconut oil from Philippines and Malaysia is inelastic or less responsive to price changes compared to Indonesia. However, the value of Indonesia's expenditure elasticity is more than 1 which means that its coconut oil has better quality than the Philippines and Malaysia with less than 1. The own price elasticity results show Philippine coconut oil is the most elastic where in the event of a change in price will have a significant impact on the magnitude of demand for coconut oil. Meanwhile, Indonesia is second and Malaysia is third with elasticity but less responsive compared to the Philippines. Market competition is shown by cross-price elasticity that indicates that Indonesian coconut oil with the Philippines is positive and means substitution or competing in the Chinese market. While Indonesia's coconut oil with Malaysia is negatively value that means complementary. However, Malaysia's coconut oil against Indonesia is positively value which means substitution relations occur. This means that Indonesian coconut oil does not compete with Malaysian coconut oil even requires Malaysian coconut oil as complementary. However, Malaysian coconut oil competes with Indonesia, as the competitiveness of Indonesian coconut oil is superior. Based on the results, this study motivated Indonesia to boost coconut oil exports to China, especially as the Philippines and Malaysia are facing rising prices.

References

Alnafissa, M., & Alderiny, M. (2020). Analysis Of Saudi Demand For Imported Honey Using An Almost Ideal Demand System (AIDS). Journal of the Saudi Society of Agricultural Sciences, 19(4), 293–298. https://doi.org/10.1016/j.jssas.2019.05.001

Alouw, J. C., & Wulandari, S. (2020). Present Status And Outlook Of Coconut Development In Indonesia. IOP Conference Series: Earth and Environmental Science, 418(1). https://doi.org/10.1088/1755-1315/418/1/012035

Amzul Rifin. (2010). An Analysis Of Indonesia ' S Palm Oil Position In The World Market : A Two-Stage Demand Approach. Oil Palm Industry Economic Journal, 10(1), 35–42.

Anggrasari, H., Sari, A. K., & Arminda, F. R. (2023). the Indonesian Coconut Oil Export Opportunities With. 4270.

Apraku, A., Liu, L., & Ayisi, C. L. (2017). Trends and Status of Dietary Coconut Oil in Aquaculture Feeds. Reviews in Fisheries Science and Aquaculture, 25(2), 126–132.

https://doi.org/10.1080/23308249.2016.1245275

Astuti, W., & Paksi, A. K. (2022). A Study about Indonesia's Crude Oil as Export Commodity. International Journal of Multicultural and Multireligious Understanding, 9(9), 402–411. https://ijmmu.com/index.php/ijmmu/article/view/4142

Aulia, A. N., Chasanah, N., Prasetyo, A. S., & Nalawati, A. N. (2020). Competitiveness and Export Similarity of Indonesia's Coconut Oil. Jurnal Agribest, 4(2), 123–132. https://doi.org/10.32528/agribest.v4i2.3546

Barthel, M., Jennings, S., Schreiber, W., Sheane, R., & Royston, S. (2018). Study On The Environmental Impact Of Palm Oil Consumption And On Existing Sustainability Standards. In LMC International Ltd. http://ec.europa.eu/environment/forests/pdf/palm_oil_study_kh0218208enn_new.pdf

Dewanti, R. P., Harianto, H., & Nurmalina, R. (2020). Analisis Permintaan Dan Persaingan Minyak Kelapa (Crude Coconut Oil) Indonesia Di Pasar Internasional. Jurnal Agribisnis Indonesia, 8(1), 69–82. https://doi.org/10.29244/jai.2020.8.1.69-82

do Rosário Ximenes, I., Nurmalina, R., & Rifin, A. (2021). Demand Analysis of Indonesia's Coconut Crude Oil in Germany. Review of Economics and Finance, 19(October), 281–285. https://doi.org/10.55365/1923.X2021.19.39

Fortunika, S. O., Harianto, H., & Suharno, S. (2021). Posisi Kopi Robusta Indonesia di Pasar Jerman Menggunakan Metode Linear Approximate Almost Ideal Demand System. Jurnal Agribisnis Indonesia, 9(1), 29–42. https://doi.org/10.29244/jai.2021.9.1.29-42

Ganda Sukmaya, S., Atika, D., & Perwita, D. (2018). Seminar Nasional Program Studi Agribisnis Fakultas Pertanian Universitas Jember. November, 168–178.

Grimhardt, E. al. (2015). EOS Series The Market for Organic Coconut Oil in Germany and the United. December, 73.

Izzatin, N. R., Durroh, B., & Masahid, M. (2023). Analisis Daya Saing Ekspor Kakao Indonesia di Pasar Internasional. Agro Bali : Agricultural Journal, 6(2), 337–349. https://doi.org/10.37637/ab.v6i2.1266

Malau, H. (2016). Exchange Rate, Inflation and Export-Import and Tiongkok (Comparative Analysis Before and After Free Trade). 215–217.

Malau, L. R. E., Ulya, N. A., Martin, E., Anjani, R., Premono, B. T., & Yulni, T. (2022). Competitiveness and Flow of Indonesian Paper Trade in The Global Market. Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan, 23(1), 1–18. https://doi.org/10.23917/jep.v23i1.17648

Malla, S., Klein, K. K., & Presseau, T. (2020). Have Health Claims Affected Demand For Fats And Meats In Canada? Canadian Journal of Agricultural Economics, 68(3), 271–287. https://doi.org/10.1111/cjag.12226

Manalu, D. S. T., Harianto, Suharno, & Hartoyo, S. (2022). Analisis Daya Saing Serta Faktor-Faktor yang Memengaruhi Pangsa Pasar Negara Eksportir Utama Kopi di Negara Importir Utama Kopi. Buletin Ilmiah Litbang Perdagangan, 16(1), 1–24. https://jurnal.kemendag.go.id/bilp/article/view/445

Mufeeth, M. M., Thariq, M. G. M., & Nufile, A. A. M. (2021). Estimation Of Demand For Coconut In Sri Lanka: An Application Of Almost Ideal Demand System (AIDS). Journal of Business Economics, 03(1), 80–87.

Pinto, J. da S., Suharno, S., & Rifin, A. (2022). Kinerja Ekspor Cengkeh Indonesia di Pasar India: Pendekatan Linear Approximate Almost Ideal Demand System (LA/AIDS). Jurnal Agribisnis Indonesia, 10(2), 262–279. https://doi.org/10.29244/jai.2022.10.2.262-279

Pratama, B. R., Tooy, D., & Kim, J. (2023). Price Competition and Shifting Demand: The Relation between Palm and Coconut Oil Exports. Sustainability (Switzerland), 16(1). https://doi.org/10.3390/su16010101

Purba, H. J., Erwidodo, Hestina, J., Yusuf, E. S., Azahari, D. H., Dabukke, F. B., & Darwis, V. (2021). Export Performance And Competitiveness Of Indonesian Coconut Oil And Desiccated Coconut. IOP Conference Series: Earth and Environmental Science, 892(1). https://doi.org/10.1088/1755-1315/892/1/012072

Rifin, A. (2013). Competitiveness of Indonesia's Cocoa Beans Export in the World Market. International Journal of Trade, Economics and Finance, 4(5), 279–281. https://doi.org/10.7763/ijtef.2013.v4.301

Sari Br Surbakti, D. P., Supriana, T., & Wibowo, R. P. (2024). Analisis Permintaan dan Persaingan Ekspor Pisang Indonesia, Filipina dan Thailand di Pasar Tiongkok dengan Menggunakan Model Almost Ideal Demand System (AIDS). Agro Bali : Agricultural Journal, 7(1), 194–204. https://doi.org/10.37637/ab.v7i1.1558

Ulubasoglu, M., Mallick, D., Wadud, M., Hone, P., & Haszler, H. (2016). Food demand elasticities for Australia. Australian Journal of Agricultural and Resource Economics, 60(2), 177–195. https://doi.org/10.1111/1467-8489.12111

Varian, H. R. (2014). Intermediate Microeconomics (Jack Repcheck (ed.); ninth).

Walter, N., & Snyder, C. (2007). Microeconomic. Thomson South-Western.

Widarjono, A. (2018). Analysis of Rice Imports in Indonesia: AIDS approach. Journal of Economics, Business & Accountancy Ventura, 21(2), 259–268. https://doi.org/10.14414/jebav.v21i2.1212

Xia, L., & Dewi, S. S. (2022). Analysis of Trade Specialization and Competitiveness of Indonesian Coconut Oil in the International Market (2010-2020). Open Journal of Business and Management, 10(01), 245–262. https://doi.org/10.4236/ojbm.2022.101015

Yulhar, T. F. M., & Darwanto, D. H. (2019). Competitiveness of Indonesian Crude Coconut Oil Export in Destination Countries. Agro Ekonomi, 30(2). https://doi.org/10.22146/ae.49014