



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

RTG 2654 Sustainable Food Systems

University of Goettingen

SustainableFood Discussion Papers

No. 10

Much more than just an ingredient:
Palm oil and its consumer perspectives in Indonesia

Sophie-Dorothe Lieke
Andriyono Kilat Adhi

August 2024

Suggested Citation

Lieke, S.-D., A.K. Adhi (2024). Much more than just an ingredient: Palm oil and its consumer perspectives in Indonesia. SustainableFood Discussion Paper 10, University of Goettingen.

Imprint

SustainableFood Discussion Paper Series (ISSN 2750-1671)

Publisher and distributor:

RTG 2654 Sustainable Food Systems (SustainableFood) – Georg-August University of Göttingen

Heinrich Döker Weg 12, 37073 Göttingen, Germany

An electronic version of the paper may be downloaded from the RTG website:

www.uni-goettingen.de/sustainablefood

SustainableFood Discussion Papers are research outputs from RTG participants and partners. They are meant to stimulate discussion, so that comments are welcome. Most manuscripts that appear as Discussion Papers are also formally submitted for publication in a journal. The responsibility for the contents of this publication rests with the author(s), not the RTG. Since discussion papers are of a preliminary nature, please contact the author(s) of a particular issue about results or caveats before referring to, or quoting, a paper. Any comments should be sent directly to the author(s).

Much more than just an ingredient: Palm oil and its consumer perspectives in Indonesia

Sophie-Dorothee Lieke^{a*} and Andriyono Kilat Adhi^b

^aDepartment of Agricultural Economics and Rural Development, University of Göttingen, University, Göttingen, Germany; sophiedorothe.lieke@uni-goettingen.de

^bDepartment of Agribusiness, Institut Pertanian Bogor, Bogor, Indonesia

*corresponding author

Abstract

While consumers in palm oil-importing countries mainly encounter palm oil as an ingredient, consumers in palm oil-producing nations additionally rely on it as their primary cooking oil. Using focus group discussions across low, middle- and high-income groups (10 groups, n=81), this paper considers underrepresented consumer perspectives by examining how the situational context in urban Indonesia influences the significance of palm oil and its consumption patterns. Palm oil catalyzes cultural practices, ensures food security and contributes to income generation. We identify perceived structural and cultural barriers inhibiting consumer-driven and local demand for more sustainable palm oil, and importantly who in consumers' eyes carry the responsibility and power to materialise these changes. This ensures that the call for improved food sustainability is not unilateral, but that action is tailored and administered at appropriate levels. Nonetheless, challenges persist as for Indonesians palm oil truly serves as so much more than just an ingredient.

Keywords: consumer behaviour, Indonesia, palm oil, socio-economic status, sustainability

1 Introduction

The diversity and versatility of palm oil properties have been heralded by sectors spanning from biofuels, cosmetics to food products. As the most consumed vegetable oil, palm oil is an attractive ingredient in the food industry as it has a high melting point, neutral flavor and due to its oxidative stability, can extend the shelf life of processed products (Dauvergne, 2018; Parsons et al., 2020). While societies in palm oil-importing countries most frequently encounter it amidst ingredient lists, in palm oil-producing countries like Indonesia, it is additionally used as a popular cooking oil in daily life. This dual role shapes different consumer experiences, interactions and perceptions towards palm oil based on the context of use.

In Indonesia, the largest producer of palm oil globally, this vegetable oil plays an important role in shaping food preparation and consumption habits and patterns. These aspects are pivotal in molding and maintaining personal, social and cultural norms and identities (Baloch et al., 2020). The widespread range of geographic and ethnic variation found across Indonesia is mirrored in its unique and highly diverse cuisine, within which palm oil has assumed an important role (Harmayani et al., 2016). Although Indonesia's two largest ethnic groups (Javanese and Sundanese), have different food handling methods, techniques and culinary characteristics, both embody and incorporate palm oil in daily practices (Wijaya, 2019). Similarly, it is also widely used in Western fast food. Since the 1980s, the presence of fast food restaurants in Indonesia has triggered a shift in cooking methods of traditional foods. While older practices involved steaming, the prevalence of deep-fried foods increasingly diffused to the household level, leading to an intensified adoption of this preparation method (Wijaya, 2019). Indonesia's urban food environment, which increasingly focuses on fried foods, is catered for by the local palm oil supply. Considering Indonesia is the world's fourth most populous country (World Bank Open Data, 2023), household demands for this commodity will continue to be substantial. The dependency and importance of palm oil were crystallized in the run-up to April 2022, when Indonesia's President Joko Widodo announced an export ban on palm oil, in light of bottlenecks in global vegetable oil supply and demand. While this ban only lasted three weeks, the impact it had on Indonesian consumers, who were already in an arena permeated with rising food prices, food scarcity and a social environment still recovering from the impacts of the COVID-19 pandemic, was significant (Adhikari et al., 2023). Hence, it is not only the use of palm oil that carries importance but also how its absence or scarcity is navigated. While palm oil has been welcomed by Indonesian society, Western consumers in palm oil-importing countries view this ingredient with more skepticism, often justified by the ecological consequences that mismanaged plantations can have (Capecchi et al., 2019; Hinkes & Christoph-Schulz, 2019). With the production of this globally important commodity in direct competition with tropical rainforests, there is abundant literature

highlighting the detrimental impacts that poorly managed oil palm plantations have on biodiversity (Teuscher et al., 2015), deforestation (Austin et al., 2017; Meijaard et al., 2020; Vijay et al., 2016), as well as negative social impacts such as on labor and land right issues (Abram et al., 2017). Much of the oil palm literature and discourse revolves around its production and cultivation, but does not consider end-consumers and their perspectives. While consumer studies in Western palm oil-importing countries are more abundant (Dauda et al., 2020; Guadalupe et al., 2019; Lieke et al., 2023; Sundaraja et al., 2022), accounts of consumers in palm oil-producing countries are underrepresented. For example, in their systematic review of perceptions towards products with or without palm oil, Savarese et al. (2022) found that 41% of the studies (25% from Malaysia, 8% from Costa Rica and 8% from Singapore) were conducted in palm oil-importing countries, none of which included Indonesia. Targeting this gap, our study aims to capture Indonesian perspectives towards palm oil as a cooking oil. Through focus group discussions, we questioned (a) the role that palm oil as a cooking oil plays in the daily lives of urban Indonesian consumers; (b) how social class shapes the use of palm oil; and (c) what external drivers sustain palm oil's function within this context. Additionally, we show how these factors underscore the barriers and pathways needed in shaping a more environmentally favorable future.

These findings are relevant as sometimes environmental targets and objectives are framed as blanket solutions, made by stakeholders who are physically removed from these contexts. The importance of accounting for stratified local perspectives is twofold: not only does it help identify barriers and ramifications on how, what and where food is consumed by different members of society, but it also helps point out the scope for realistic, context-based solutions at appropriate levels of power and responsibility that can leverage a country's current potential in pursuing sustainability targets.

This paper is structured as follows. It begins with a literature review describing Indonesia's palm oil production and local perceptions towards it, before widening the scope and situating Indonesian food consumption within social class. It proceeds with an outline of the methodological procedure. The next section highlights our findings, followed by a discussion of the results, limitations and scope for future research. The final section presents our conclusions.

2 Literature Review

2.1 Palm oil production in Indonesia

Despite being native to western Africa, the vast majority of oil palm cultivation happens in Southeast Asia. Leading in global production, Indonesia produced an average of just under 20 million tons between 1994-2021, followed by Malaysia's production of 15 million tons (FAOSTAT, 2023). Although 85% of total palm oil produced in Indonesia is deemed for export (Shigetomi et al., 2020), domestic consumption is increasing. Between 2020 to 2021, local consumption saw a 10% increase (EPOA et al., 2022). Understanding the role that palm oil plays in domestic consumption has important sustainability implications. For example, palm oil consumed in Indonesia accounted for 11.7% of the land use consumption footprint between 2005-2010 (Shigetomi et al., 2020). Not only does palm oil designated for the food industry exert environmental pressure, but increasing demands by the local energy sector further intensify the environmental challenges associated with oil palm cultivation. While the European Union and other countries in the Global North are intensifying their demand for more sustainably produced palm oil, other countries have followed suit more sluggishly. The presence of more stringent sustainability regulations in some countries lends itself to a leakage effect, whereby sustainably produced palm oil is exported to those who require it, while palm oil produced under suboptimal socio-ecological conditions is used for domestic consumption or exported to countries with less binding regulations. While the large proportion of domestic consumption presents itself as an opportunity to substantially drive more sustainable practices, upkeeping the status quo also poses the risk of undermining and diluting the benefits that external regulations have on society and the environment (Busch et al., 2022). With domestic usage continuously increasing, it becomes evident that the burden of addressing environmental issues related to oil palm cultivation and production should not solely be initiated by palm oil-importing countries. Addressing these issues internally could yield significantly larger impacts.

2.2 Perceptions of palm oil from Indonesia

Palm oil is a common cooking oil found in kitchens spanning diverse socio-economic backgrounds. Although the literature is scant, perceptions of palm oil differ when comparing Indonesians who only use it as a cooking oil with those who are engaged in the oil palm industry. Individuals solely consuming it see palm oil more as a cultural asset, a perspective that the palm oil sector heavily propagates (Tyson et al., 2018). Sourcing local ingredients carries a sense of pride, as it weaves and strengthens the preservation of tradition and culture. Many traditional Indonesian recipes rely on the use of local ingredients, including oil, which further fosters support for its continued use (Arsil et al., 2018). While the type of oil has

changed over time, the affordability of palm oil renders it an attractive choice across social groups.

In some food environments, palm oil as a cooking oil has become an important source of nutrients (Zulkipli et al., 2019). With around 100 million Indonesians suffering from micronutrient deficiencies (Ickowitz et al., 2016), unbleached palm oil is a source of energy and vitamins A and D (Sibhatu, 2023). Additionally, oil palm cultivation can have secondary effects on health and nutrition for both consumers and producers. Smallholders engaging in oil palm cultivation are more food secure and can consume a more diverse diet due to positive income effects (Chrisendo et al., 2020).

However, individuals living closer to plantations are also affected by indirect negative health impacts resulting from unsustainable oil palm cultivation practices. These include respiratory issues, and skin and eye diseases (Kadandale et al., 2019). Being involved in the oil palm sector not only has impacts on physical health but also on mental health, with workers and employees often linking its production as a cause for social and community conflicts. Despite initial welfare opportunities, including economic gains and increased food security among previously subsistence households, these positives may be outshone by persisting socio-economic disputes often related to land tenure, boundaries and land ownership (Moreno-Peñaranda et al., 2015; Santika et al., 2019). Abram et al. (2017) found that communities that are more dependent on ecosystem services provided by forests viewed oil palm more critically, as they feared that oil palm development and expansion would compromise their environment and livelihoods. Hence, how Indonesians use and interact with oil palms and palm oil, whether solely as consumers or also involved in its production, not only influences direct benefits but also contributes to potential negative effects and experiences.

2.3 Social class and food in Indonesia

It is well understood that foodways, being the cultural and social experiences including the social class (*position*) and repeated behaviors (*habitus*) that take place within daily life (Alkon et al., 2013), influence the acquisition and longevity of food preferences and tastes (Bourdieu, 1984). While the type of food consumed is partially dependent on economic capital, it is crucially and inextricably linked to cultural capital, which is a desired palate that has been refined through cultural norms and values (Kamphuis et al., 2015). Despite differences in demographics, Indonesian consumers from various social classes express similar preferences towards the consumption of local foods, motivated by quality and tradition (Arsil et al., 2018). This palate alongside food consumption patterns is currently experiencing a dietary and nutritional transition, marked by the increasing consumption of convenient and ultra-processed foods which are more conducive to a faster-paced lifestyle. While the consumption of food at

Western chain restaurants is especially favored among the more affluent, those less affluent opt for equivalent options from street food vendors. Thus, even though the context may differ, the nutrients consumed remain similar across social groups (Anyanwu et al., 2022). Likewise, in-home rice consumption, a longstanding staple across the consumer palate, is gradually being undermined by more convenience-based foods (Rozi et al., 2023). This is part of a broader movement where the level of home-cooked foods relative to food consumed outside the home is increasing across the urban Indonesian society.

While changes in preferences and consumption habits may take on different forms depending on socio-economic background, the mechanisms driving the changes in desired palate remain similar (Rozi et al., 2023). Indonesia offers a culture where the bridging of cultural capital, a phenomenon where individuals exchange, learn and share experiences, is already common, yet is even more strongly apparent during times of hardship, such as those seen during the COVID-19 pandemic (Rusmawati et al., 2023). The sensory appeal, as well as the practicality and convenience of street-and fast food, has enabled it to infiltrate different social classes, as evidenced by both the consumer's reliance on this type of food, but also the street-and fast food provider's dependency on consumers to ensure their income (Harmayani et al., 2016). This interdependence exacerbated the impact felt by small and medium-sized eateries, which struggled during the pandemic, as out-of-home food consumption drastically declined (Rozaki, 2021). While Indonesia's social classes revolve around a shared food-related axis, they prioritize distinct values while occupying different positions on it. Given the mutual foundation, the drivers and shocks that influence Indonesian food consumption affect everyone, albeit in different ways.

3 Methodology

3.1 Focus group discussions

Qualitative data is well suited for this study as its explorative nature allows insights to be gathered about both social and personal meanings, perceptions and experiences related to palm oil in Indonesia (Harris et al., 2009). A total of ten Focus Group Discussions (FGDs) with 81 individuals were conducted in November 2022. Discussions were held in seminar and conference rooms and lasted between 60-120 minutes. The discussions took place in Bahasa and English, and were translated as necessary. They were then anonymized and transcribed. All FGDs had a moderator with at least two other researchers acting as a translator and a scribe. This is important to ensure meanings, linguistic- and cultural essences are not lost when conducting cross-cultural research (Liamputtong, 2010). All participants received a small travel compensation. This study obtained ethical approval from the Indonesian National

Research and Innovation Agency (Badan Riset dan Inovasi Nasional) and the Ethics Commission at the first author's university.

3.2 Respondent sample

Snowball recruitment was used to invite participants around Bogor, Indonesia who were then grouped by income level (low, medium and high). Income levels were benchmarked against the city's average. Bogor is a city with a population of around one million making it the 6th largest city within the Jakarta metropolitan area (Statistics Bogor City, 2017). While palm oil is generally used across socio-economic backgrounds, income-related lifestyles reflect the role it plays. Bogor is well suited to accommodate this diversity, as its rural-urban interface, as well as being home to academic and research institutions, enabled us to engage with individuals from various backgrounds and levels of expertise. Despite the value of mixing participants with concurring and opposing views (Bryman, 2016), participants may feel more comfortable discussing with individuals from similar backgrounds. Three FGDs were conducted with respondents from low-income backgrounds, five FGDs with respondents from middle-income backgrounds and two FGDs with respondents from higher-income backgrounds. Although logistical restrictions caused an imbalance in the number of focus groups per income group, based on recommendations by Guest et al. (2017), this sample is still sufficient.

All participants were between the ages of 18 and 64. An overview of the socio-demographics can be found in Table 1. Over 40% (43% and 41%) of the respondents do all of their grocery shopping and food preparation themselves (Table 1). This means that these individuals play a key part in food handling at the household level, including using palm oil, which ensures relevant perspectives. None of the respondents were directly associated with the oil palm industry, although several had relatives or friends involved in the business. Respondents' occupations varied from street food vendors, housewives, and on-demand motorbike taxi drivers in the lower socio-economic backgrounds to business owners, academics and entrepreneurs amongst others, in the higher socio-economic classes.

Table 1: Socio-demographics of participants in the focus group discussions (n=81)

Category	Breakdown	Percentage
Age	Mean age (years)	37
Gender	Males	46%
	Females	54%
Income*	Low	30%
	Lower Middle	44%
	Upper Middle	22%
	High	4%
Education	No Education	1%
	Primary	31%
	Secondary	32%
	Tertiary	36%
Cooking & Shopping Behavior	Responsible for all the cooking	43%
	Responsible for all the shopping	41%

***Note:** Groups based on average income levels in Bogor, Indonesia

3.3 Procedure

Before starting the FGDs, participants were briefed on the topic and given information on the data protection protocol. They were then invited to give their consent to take part in the study. With permission, all the FGDs were audio recorded. Additional basic socio-demographic details (gender, age, educational attainment, and role in grocery shopping and food preparation) were asked. A discussion outline can be found in the supplementary materials.

The FGDs started with free-elicitation word association brainstorming activities (Rojas-Rivas et al., 2022). Participants were initially asked what comes to their mind when they hear the term 'vegetable oil', followed by the term 'palm oil' specifically. All responses were mapped out on pieces of paper, with succeeding questions asked on why this association was made. Starting the FGDs with such an activity allowed a thematic comparison between vegetable oil and palm oil, ensured clarity of linguistic differences, and by being collaborative and engaging in nature simultaneously acted as an appropriate ice-breaker activity.

Following the brainstorming activity, the main points of discussion were guided by a previously prepared outline of theme-based questions. This facilitated natural and coherent conversations, framed by inductive and deductive reasoning. The main themes that were prompted included daily uses of palm oil, purchasing habits, cultural importance and personal values (including health perceptions), as well as perceived representations of palm oil in Indonesia and abroad. A selection of images with different types of palm oil bottles were used

to aid discussion at different points of the session. Providing visual stimuli allows for the exploration into the meaning and value that different brands and products carry, as well as the appeal and confidence (or lack thereof) that participants have towards specific product characteristics (Mancini et al., 2017).

Once the researchers felt that all topics had been exhausted and theoretical saturation of new content had been reached (Nyumba et al., 2018), the discussion was closed. After allowing participants to ask questions, they received their compensation and were dismissed.

3.4 Analysis

Transcripts were coded and analyzed with MAXQDA (Release 22.6.0). Emerging themes were framed by thematic content analysis, based on recommendations by Braun and Clarke (2006). The codes were organized into 56 primary categories which were subsequently categorized into 20 broader topics. Coding was continued until theoretical saturation was reached, which is when no new codes emerged (Nyumba et al., 2018). The topics were then grouped into 8 broader themes. Once all transcripts had been considered individually, the themes were deconstructed based on income group (low, middle, high).

4 Results

Our results show that palm oil as a cooking oil does not exist in isolation but in the context of different lifestyles and food-related behaviors. Although palm oil is consumed across social classes, the purpose it serves and perspectives towards it, particularly concerning access, coping with its scarcity and health impacts, are dependent on affluence and social class. While habits, repeated practices and routinised behaviors contribute to its dependency on an individual level, cultural and structural drivers further pave its conduciveness on a broader social level (Figure 1).

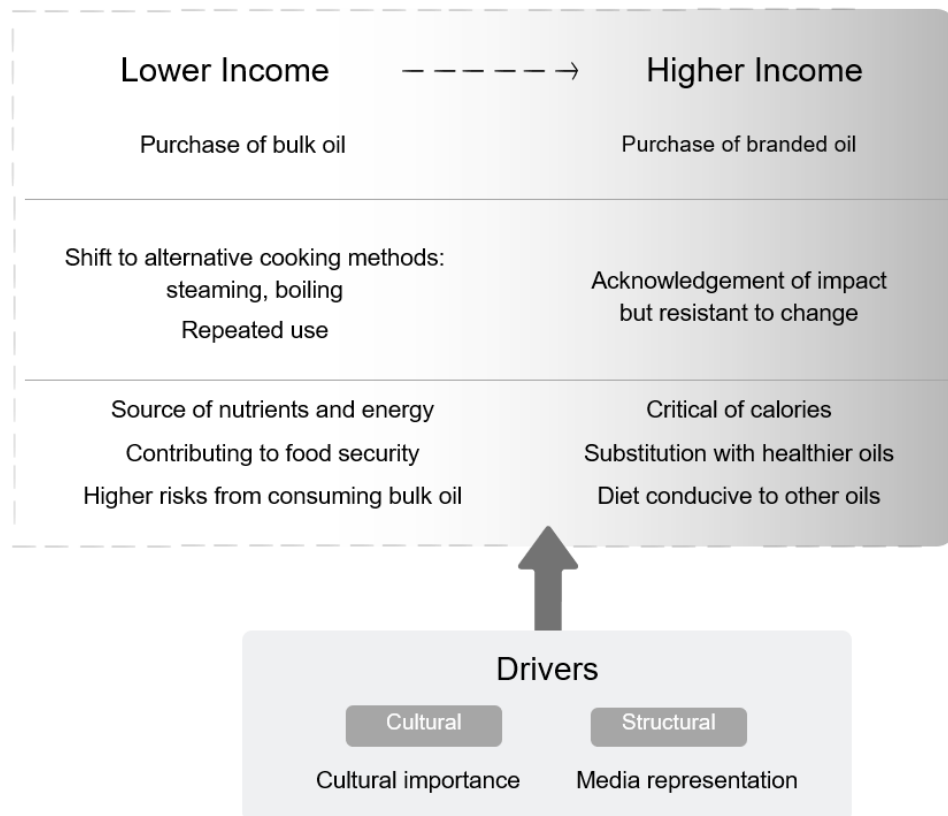


Figure 1: Conceptual overview of how access, adaptation strategies and health perceptions towards palm oil differ depending on income class, and how these are underpinned by socio-cultural and structural drivers.

4.1 Palm oil as a cooking oil: From bulk to brands

4.1.1 Role of bulk palm oil

While palm oil is consumed across Indonesia's social classes, the type of oil used is not the same. Alongside conventional packaged and branded palm oil exists bulk palm oil ('*Minyak curah*'). Unofficial, unregulated and therefore cheaper, this more affordable oil plays an important role in ensuring access to oil for individuals from lower socio-economic backgrounds. Hence, it was frequently mentioned as the primary oil used by respondents from this class. More affluent respondents did not use it themselves but were aware that less fortunate individuals frequently take advantage of bulk oil. Bulk palm oil is mostly traded at traditional markets where it is exposed to sunlight and handled in vessels susceptible to contamination which increases health risks and rancidity. Many of the low-income respondents who use bulk oil raised this as a safety concern. Nonetheless, street food vendors and those who owned small roadside eateries ('*warung*') especially, mentioned that they were highly dependent on bulk palm oil. Given that it is not branded, street vendors barter to try to get even cheaper prices, often remaining loyal to sellers with whom they have traded in the

past. The trade-off is that with no existing standards to be met, the composition of bulk oil varies. Both respondents who use it in their jobs selling street food and those who use bulk oil at home noticed variations in the frequency of reusing this oil. *“If you use bulk oil once, it will turn black immediately. That is the difference between bulk oil and packaged oil. Packaged oil you can reuse, but bulk oil is cheap.”* (LI¹ 1, respondent C) and *“Bulk oil is more wasteful, it runs out faster while packaged oil lasts longer.”* (LI 1, respondent H). Although branded oil increases the number of times it can be reused, many street food sellers said they are unable to afford the premium oil from the outset: *“The price for bulk palm oil is cheap, but it also is not so good, but I don’t have other options. At least I have some oil to cook my fritters in which I can sell.”* (LI 3, respondent D). Bulk oil is more economical in the immediate term, but is less efficient in the long term. One respondent, who previously used bulk oil but can now afford branded oil commented that while there are health trade-offs at stake and ideally the use of regulated packaged oil should be more economically accessible, the fact that there is segmented access to cooking oil enables economically disadvantaged individuals to address their immediate needs. Hence, bulk palm oil can catalyze income generation, especially in a culture where fried snacks and street food are widely consumed.

4.1.2 Role of branded palm oil

The vast majority of middle- to high-income Indonesian consumers buy branded palm oil sold in bottles or sachets at corner/convenience stores and supermarkets. Despite the presence of many brands, *Bimoli* is specifically recognized as the most popular and well-known brand across all focus groups. However, while this is perceived as the most renowned brand, most respondents who buy branded oil were not so much driven by brand, but rather by price and convenience. *“We don’t have loyalty to one brand, we just look for the cheapest one.”* (MI² 2, Respondent F). Promotions and sales of palm oil are common and often very sought after. *“I will always take the one with the discount.”* (HI³ 1, Respondent H) *“If the price is the same, both colors of the oil are reasonable, it doesn’t matter which brand.”* (LI 3, Respondent F). Promotions were valued across all social classes, with the only difference being that those in lower social classes mainly looked for them at corner stores, while individuals in higher social classes not only took advantage of in-store promotions but also promotions on apps and online shops. Promotions not only undermine brand loyalty but also shop loyalty. Unlike those consumers purchasing bulk oil, more affluent respondents reported that they would purchase their branded palm oil in stores where the discounts were and because of the temporality of promotions, their point of purchase mirrored that. *“When buying oil, I buy there where the*

¹ Low Income Group

² Middle Income Group

³ High Income Group

promos are- I don't care where that is or what brand, just what the best promo is." (MI 3, Respondent J). Although personal preferences may differ depending on the functional attributes of bottles or sachets of palm oil (for example, sachets are more convenient to store, bottles are more practical when pouring and can be refilled and reused), it is the discounted price and the promotions that are ultimately the common denominator in influencing purchase decisions for urban Indonesian consumers, irrespective of socio-economic status.

4.2 Adapting to an absence of palm oil

4.2.1 Replacing cooking methods

With palm oil playing such a pivotal role in shaping food preparation methods, its absence, whether due to the COVID-19 pandemic or exponential price increase in response to changes in the global oil trade rendering it financially unattainable, has far-reaching, albeit varying effects, in how food was cooked, served and consumed by different urban social classes. Respondents from low-income classes mentioned the need to change their food preparation methods, with all of them commenting on the challenges they faced. For many, common adaptation mechanisms included replacing deep frying with steaming or boiling practices. More households used *pepes*, an Indonesian cooking method which uses banana leaves to create little parcels of meats, fish, tofu or vegetables which are steamed or grilled. One respondent, who normally sells deep-fried tofu, said that he would have opted for *pepes*, but his cart was only suited to deep fry foods and there was no capacity to grill or boil the food instead. Several women said that they could change their food preparation methods at home, but were not comfortable in doing so because using different methods implies having to consume different foods, which are less familiar and thus less appealing.

Not only does the lack of available oil change the type of food prepared and eaten, but boiling food is marked with a stigma of being less popular, less tasty, a food preparation method used by the poor and used during times of sickness: "*Boiled food doesn't taste good. Only poor people eat it.*" (LI 1, respondent G) and "*It [boiling food] is for sick people who can't eat anything else*" (LI 1, respondent H). An intermediate option was sautéing foods instead of deep frying, a practice that was particularly common among the middle class. This was seen to be more acceptable as it was not too far from the norm, still involved the use of some oil and is less stigmatized than the boiled foods served when ill or as an indicator of poverty.

Given their lower dependency on palm oil and having more purchasing power to buy alternative oils, respondents from higher social classes stated that they were less affected by physical scarcity or inaccessibility when prices increased. Although more expensive, affluent consumers use coconut and olive oil as frequent alternatives. Others used the scarcity as a vehicle to reduce the consumption of palm oil and substitute it with other oils: "*I have now*

actually started to reduce palm oil and use less oil generally, it is better for my health" (HI 2, respondent B), and *"When stir-frying, I used only a little oil and then water. I think it is healthier!"* (HI 1, respondent E). Many respondents who had the financial capacity to change saw the positive externalities whereby this structural change helped them adopt healthier cooking practices.

4.2.2 Reusing oil

The physical or financial scarcity of palm oil has stressed the importance of oil reuse. While many respondents reuse oil, those who are less affluent rely on reusing it more heavily. Reusing oil is common practice, with visual indicators signaling when it should be replaced. *"Once it is black, throw it away."* (MI 2, respondent H). More affluent individuals mentioned they would reuse cooking oil a maximum of two times. In contrast, for less affluent individuals the high oil prices put them in situations where they would reuse the oil again even in situations where they would have previously discarded it. *"Especially when the prices are high, it is better to reuse the oil again-and again-and again before throwing it away."* (MI 4, Respondent B). Although aware of the health implications, they felt that this trade-off was worth it. Some respondents also said that they would experiment with innovative ways of clearing and settling the 'blackened' and rancid oil with rice to extend its reusability. Furthermore, some were very particular about the order in which they would fry their food to prolong the oil's use: *"You first have to fry lighter foods like tempeh and tofu, then after that fish, because it turns the oil black immediately."* (LI 1, Respondent A). Individuals from lower-income backgrounds voiced how reusing oil gives them a greater sense of control and power over efficiency, but with that comes having to be more creative in dealing with its scarcity.

Individuals from higher social classes were not affected to the same extent, yet they acknowledged that the scarcity had disproportionate effects, with them being in a better position than much of society: *"It [the absence of palm oil] hurts us, but it doesn't kill."* (HI 2, Respondent C). They mentioned that there were evident disparities in coping mechanisms that some members of society had to adopt, while they had the privilege of having more flexible capacities.

4.3 The role of palm oil and health

4.3.1 Health perceptions amongst lower social classes

Health perceptions towards palm oil varied across the socio-economic groups. For those in lower socio-economic classes, who generally also had lower knowledge about healthy lifestyles and foods, connotations were more layered. Many of these participants viewed oils positively, often coupling and extending the perceived health benefits of oils used in traditional

medicine, with oils used in cooking. While there was an evident preference for coconut and olive oil for medicinal and cosmetic purposes including *kerokan* (scraping) massages and fever relief (oil mixed with warm water believed to neutralize blood flow), those who felt that they could not afford these more expensive oils would also use palm oil to serve the same purposes.

Women in this group said they paid little attention to the nutritional content of the oils, which they often did not understand. Similarly, they did not value any additional processing information on packages such as 'premium', or 'refined', nor were they influenced by the, albeit rare, sustainability-related labels or claims. This is because they often bought unlabeled bulk oil, and had less experience with packaged oil. Instead, these women focused on the caloric value and the role that palm oil plays in their food security. One respondent mentioned that oil is important in their diet because it makes them feel full and is a cheap source of energy and vitamins. They acknowledged the negative health effects of overconsumption, but for the here and now, its role in meeting their basic nutritional needs was more important.

4.3.2 Health perceptions amongst higher social classes

Although middle- and higher-income individuals use branded oil more frequently, there is a tendency to use packaging information for expiration dates, rather than for nutritional contents or other phrases indicative of different processing methods. Emerging in middle-income groups stronger than in the higher-income groups was evidence that the use of palm oil shows a reverse correlation with increased health concerns. This relationship is not primarily influenced by the quantity of oil used, but rather by the role the oil plays in the overall dietary patterns. Health-conscious individuals who already adopted a healthy lifestyle such as incorporating physical activity in their daily lives, placed a greater emphasis on palm oil substitution justified by the perceived health benefits of alternative oils. For example, two respondents mentioned that due to sickness in the family (diabetes), they preferred to use other oils such as coconut oil and bought oils with 'low calorie' labels (e.g., low-calorie sprays). It was found that many respondents considered diet diversification as a driver for consuming various vegetable oils: "*There is oil for salads, oil for stir-frying and oil for frying.*" (HI 2, respondent C). Olive oil was strongly associated with the consumption of salads, Italian foods and more 'fragrant' international foods. Individuals with more varied diets tended to consume a wider variety of oils, accompanied by the consumption of more fresh legumes and vegetables. That said, many still do acknowledge the price differences between the oils: "*Many Indonesians are already concerned about being healthy and making healthier choices, also with oils, but alternatives are still a lot more expensive*" (MI 3, respondent A). Despite acknowledging the perceived health attributes of other oils, many respondents continue to buy

palm oil, especially for its functional benefits when deep-frying. Even for health-conscious individuals deep-fried foods play a role culturally, with palm oil being the best perceived oil for this purpose.

4.4 Drivers

The previous section highlighted how palm oil is used on a day-to-day basis. The role that palm oil plays in Indonesian culture and how learnings and experiences are transferred are driven by socio-cultural inputs, while the material environment and the representation of palm oil in the media emerged as a key structural driver that helps sustain palm oil's role in daily life.

4.4.1 Socio-cultural drivers

With palm oil playing such a pivotal role in Indonesian culture and cuisine, individuals are exposed to it early on:

One of the first things we learn growing up is what we eat. And since most foods in Indonesia are fried, especially people in lower social classes have a focus on oil in their food, right from the beginning.

(MI 4, Respondent B)

Sharing traditional knowledge and practices plays an important role in keeping dishes, culinary techniques and uses of particular ingredients alive. When asked why this was so important, many alluded to the fact that the use of oil in traditional dishes is not only representative of the actual foods *per se* but also acts as a connector to their cultural identity, and typical eating behaviors as to where and what food is consumed.

With Indonesia having a prominent street food culture, many of the vendors rely on oil to fry their foods which they then sell. Some of these street foods typically include *gorengan* (deep-fried vegetable, tofu, or tempeh fritters), *pisang goreng* (deep fried bananas), *risoles* (deep-fried stuffed pancakes) or *martabak* (thick, fried sweet or savory pancakes). While palm oil usage decreases with affluence, it is widely acknowledged that oil is an important part of Indonesian lifestyles: “*There are no days without palm oil.*” (MI 3, Respondent J). This reemphasizes the salience of oil in daily life. Furthermore, although owning air fryers was mentioned a few times amongst individuals from higher socio-economic classes as an alternative to deep frying, many respondents, especially those from lower social classes, do not have much exposure and access to ovens. Familiarity with baked dishes is minimal and is relatively uncommon in Indonesian cuisine. Hence, the absence of additional material infrastructure was also seen to encourage a preference for frying practices.

The ramifications of oil scarcity are evident through both direct and indirect psychosocial means. The direct effects include the inability to prepare specific foods, while indirect effects manifested themselves as anxiety and other mental and physical impacts experienced disproportionately by women, who are often responsible for cooking and meal preparation. *“If you don’t have it [palm oil], you get dizzy, confused- too much pressure of what to do now.”* (LI 2, Respondent J). To avoid this situation, women are seen to stock up on palm oil: *“Most housewives buy cooking oil not because they ran out of it, but because they are traumatized [of not having it].”* (MI 3, Respondent G). Women, especially from lower socio-economic backgrounds, not only play a prominent role in reproducing its use as they are predominantly responsible for the cooking, but also face pressure from their families to continue preparing the same dishes, even in times of resource scarcity.

4.4.2 The media

Advertisements and media representation of palm oil emerged as a structural driver influencing how perceptions towards this vegetable oil are shaped. Visual cues, such as the clarity and color of the oil, were commonly commented on as being characteristic of palm oil advertisements. This observation was particularly shared by women from lower social classes, who frequently inferred quality based on the color of the oil and used it as an indicator of trustworthiness for bulk oil. These women also noted that if they saw someone cooking in palm oil advertisements, it was typically a woman. This reinforces the stereotype of perceived gender roles, reiterating the fact that in the absence of oil, women are faced with a disproportionate amount of responsibility, especially when trying to conform to social and familial norms. Respondents across all groups commented on the fact that the vast majority of palm oil- related media were related to the end product. During April 2022, when palm oil exports were temporarily halted, news channels frequently reported on the price fluctuations in crude oil. Rarely did consumers see palm oil situated in its production context. Less educated respondents expressed that while they knew that palm oil comes from oil palms, they had little knowledge of what plantations look like nor what negative externalities can result from its production, as they were never shown these in the media.

I think that most media on palm oil outside of Indonesia is seen negatively, especially because of its environmental reasons. Here the media never shows the negative environmental impacts palm oil can have. It is a sensitive topic because we use it as part of our daily lives, we are reliant on it. What would we do without oil?

(MI 4, respondent D)

The respondent alludes to the belief that the indispensability of palm oil in Indonesia contributes to its warped portrayal in the media. The more educated individuals found that Indonesian media tended to exclude the cultivation aspects of palm oil and avoided addressing negative issues associated with its production. This was very different to how they have experienced mainstream media representing palm oil abroad.

4.5 Palm oil's future through the eyes of consumers

The tensions and complexities of addressing the impacts of continued palm oil use in Indonesia with external calls for more sustainable oil palm cultivation have also been recognized by respondents who were aware of existing environmental issues. When asked about opinions and pathways required to take towards a more sustainable future, their perspective was not to limit it, but rather work within the reality that the demand for palm oil will continue to increase. The most sustainable option for the environment and Indonesian society was to increase efficiency by people who have the power to do so:

Reducing palm oil consumption seems impossible. When stocks are low, people are really struggling. Issues must be handled on the plantation level, they can produce more, on the same amount of land. Consumers have no control over their choices.

(MI 4, respondent G)

When asked what participants would suggest as solutions, responses were linked to how much they appreciated and valued forests.

Indonesia's forests are our source of oxygen. With our demand for palm oil, we are instantaneously disrupting that through land clearing, burning, creating air pollution and killing the animals. If we want to produce more sustainably, we cannot clear more land. Cleared land needs to be used more efficiently and effectively.

(HI 2, respondent A)

Understanding how to navigate the trade-offs between economic benefits towards the Indonesian economy, social needs and environmental impacts, requires a multi-pronged approach. However, even individuals from higher-income backgrounds, who possess greater capacity and agency in environmental decision-making, perceive their influence as relatively weak. Perceived consumer effectiveness in contributing towards a more sustainable future is low, as choices in executing intentions are limited and constrained. Instead, respondents felt that meaningful change need to come from top-down decision-makers. Furthermore, a barrier to change was that while criticism from abroad was abundant, constructive solutions were absent: "*Indonesia gets criticized, but we don't get solutions.*" (MI 4, respondent B).

Respondents who were more concerned about the international bargaining and trading power that palm oil grants Indonesia viewed the environmental impacts as an accepted reality, fueled by politics: “*Environmental issues are just a political game.*” (HI 2, respondent G). It is mainly palm oil-importing countries that are calling for more environmental regulations, which to some is seen to be “*greedy*” (HI 2, respondent C) as it implicitly impedes Indonesia from developing.

We are a developing country, and yes there will be deforestation but that will help us become developed. Then, deforestation will stop and we can re-build the forest, but now they are stopping us from developing.

(HI 1, respondent D).

With the respondent referring to the Environmental Kuznets Curve, this presents a trade-off between how environmental impacts and economic development can and should be navigated. It raises questions regarding the extent to which present sacrifices are justifiable and acceptable for the sake of progress and development, both by the producing country and countries abroad who are nonetheless dependent on this commodity.

5 Discussion

This study explored how palm oil is perceived and used while identifying factors that perpetuate its place amongst Indonesian urban consumer households. The FGDs revealed that palm oil is an important asset to the Indonesian food environment. Although it is used by all members of society, its utilization varies with social class. Our exploration into understanding how palm oil is situated within urban Indonesian lifestyles showed a) a nuanced understanding of how the oil is incorporated into daily life while identifying varying levels of resilience and coping strategies when access to this commodity is compromised; b) how socio-cultural drivers and the media sustain the appeal and portrayal of palm oil amongst Indonesian consumers; and c) Indonesian consumers’ perspectives on where the challenges and responsibilities associated with curating an increased local demand for sustainably produced palm oil lie.

5.1 Access for all: Daily life with palm oil

With Indonesia being the world’s largest producer of palm oil, it is widely abundant across different points of sale spanning traditional markets, corner/convenience stores and supermarkets. In keeping with Santosa and Guinard’s (2011) findings, which show that specific attributes of olive oil serve as the premise for functional consequences and higher values, our study likewise demonstrates how palm oil in the Indonesian context extends

beyond its mere physical attributes. Instead, it holds social and cultural significance. The type of oil, whether branded or bulk palm oil, has become a marker of social class (Mardatillah et al., 2019). As also seen in other contexts (Rheinländer et al., 2008; Zorba & Kaptan, 2011), users of bulk oil are stigmatized as belonging to lower social classes. Additionally, it renders certain points of sale, such as the traditional markets, unhygienic and unsafe, thereby increasing the risks of its consumption. Although supermarkets may be viewed as safer points of sale, the cost is a large barrier to access (Wertheim-Heck et al., 2015). Despite health concerns, some consumers from lower socio-economic backgrounds may not have the means to access safer foods. Nonetheless, this segmented access to oils, albeit of different qualities, enables users from all social classes to use palm oil. It mobilizes individuals from lower socio-economic backgrounds to access a commodity that catalyzes benefits that stretch beyond the physical entity of cooking oil while contributing to income generation and the availability of affordable and easily consumable ethnic and traditional foods and snacks (Arsil et al., 2022). Furthermore, especially for the less affluent who typically buy their bulk oil at traditional markets, the informal interactions involving haggling or bartering between buyers and sellers play a role in shaping their social food environment. Within these interactions, connections and relationships are maintained, which illustrate how commodities can actively shape how the broader food environment is embodied and experienced. This resonates with Rozin's (2005) view that foods and ingredients can be *social vehicles*, carrying deeper meaning and significance beyond their direct nutritional composition.

Similarly, affluent consumers, who typically already have more of a diversified diet, tend to also use other oils that may be perceived as healthier and better suited for specific purposes (such as olive oil for salads or coconut oil for stir-fries). Nonetheless, given palm oil's ability to withstand high temperatures, it continues to be used for that purpose, particularly in traditional dishes, even among higher socio-economic classes.

Unlike Oncini (2019), we find that more affluent consumers are not deterred from purchasing discounted and promoted products. Instead, the importance of seeking out the best deals was found to exist across social strata. While not so pervasive as in lower social classes, a price-driven mentality is still evident with increased affluence. Product promotions are highly sought after with them outweighing brand loyalty. The strength of promotions as a driver of consumer choice amongst Indonesians was also found by Arsil et al. (2018). Overall, it is the different lifestyles that influence the role of palm oil in daily life and dictate the frequency of its use, but what unites users and reinforces its usage is its suitability for preparing traditional and ethnic foods and snacks.

5.2 Impacts of its use

Palm oil profits from its allure with how conducive it is to the Indonesian culture. While older traditional Indonesian cuisine relied more on steaming and boiling preparation methods, fried and crispy foods have gained immense popularity among Indonesians (Romulo & Surya, 2021). The rise of deep-fried foods by street vendors is the synergistic blend of Western, fast food mixed with traditional Indonesian cuisine. Many of these snacks and fried foods are served as local variations of typical fast foods such as burgers and fried chicken (Herminingrum, 2020). This fusion and widespread adoption solidifies palm oil's use across Indonesian society.

The role that palm oil has assumed in culture also has a gender dimension, especially experienced by the lower socio-economic classes. The scarcity of palm oil affects women and men differently. During periods of limited supply, the absence of palm oil placed a greater mental burden on women, who are traditionally responsible for domestic cooking. It triggered anxiety, uncertainty and family pressures. Indonesian parents, especially less affluent mothers, depend on traditional snacks and street foods, as they provide a cost-effective, easy and tasty way of provisioning for their children (Blum et al., 2019; Riptiono et al., 2020). However, increasing prices compromised affordability, leading mothers to seek alternative ways of feeding their children. This was especially concerning during school hours, as this is where children would rely most heavily on street food vendors.

On the other hand, men, who are generally viewed as the primary breadwinners (Utomo, 2015) and often engage in selling street food, faced different pressures. They had to increase their prices which affected income generation. While women were more affected by palm oil's scarcity on mental and emotional levels, men faced direct financial challenges through reduced income. Not only did the unavailability of palm oil have varying impacts on gender, but having to change food preparation patterns was also experienced differently between social classes. With typical Indonesian foods not requiring extensive utensils (Wijaya, 2019), simply switching to alternative food preparation methods is not a straightforward task for those who are not familiar with them. Poorer households had to resort to and cope with changes in food preparation methods (such as steaming or boiling) by consequence, while more affluent income groups opted for these methods by choice. This appertains within a Bourdieusian theoretical anchor (Bourdieu, 1984), as while there is a shared desire for a common taste, disparities arise from different social circumstances. The affluent have more freedom in acquiring a taste that emphasizes quality, while for the less affluent it is a taste that is shaped out of necessity (Baumann et al., 2019). The perceived lack of control over food-related

choices exacerbates the impact experienced and the extent to which levels of resilience and coping strategies need to be adopted.

Not only do daily patterns and habits impact how palm oil is used and perceived but also how it is presented to Indonesian society. Mainstream media and advertisements often present palm oil in the context of a kitchen. Rarely do they showcase its origins, cultivation practices and production systems. As a result, many individuals who are not actively engaging with other information sources remain unaware of the negative impacts associated with the palm oil production (Liu et al., 2020). In contrast, better-educated individuals are more aware of the critical dialogue surrounding its production. In Indonesia, palm oil's general narrative is presented in a way that tends to omit the negative environmental aspects, which contributes to a lack of consumer awareness and knowledge of the environmental consequences their consumption patterns may have, and hinders their potential to contribute to making food systems more sustainable.

5.3 Implications for the future

Low levels of knowledge, poor awareness and the intangibility and perceived distance of the environmental impacts that the production of palm oil can have pose challenges to consumers in recognizing their role in shifting towards more sustainable food consumption. Consumers who are aware of environmental issues caused by poorly managed oil palm farms may recognize the issue but feel limited in their capacity to act on this knowledge. This aspect is often overlooked amidst international critique of palm oil. In particular, external solutions are often blanket-based, and fail to consider the contextual environment where palm oil is not only an ingredient, but where a significant proportion of the population heavily depends on it as a cooking oil.

This is not helped by a context where the presence and availability of sustainably produced products is low, with those who are more aware finding environment-related claims and labels confusing, and those less affluent finding these irrelevant (Raghunathan & Beitien, 2021). To date, *PT Lion SuperIndo* is the only large retailer in Indonesia to offer RSPO (Roundtable on Sustainable Palm Oil) certified sustainable palm oil on its own brand palm oil (WWF, 2021). While the availability of labeled and certified sustainable palm oil for local Indonesians is still in its infancy, its effectiveness in motivating consumers to make pro-environmental choices during their purchases remains questionable (Rizkalla & Setiadi, 2022). Raghunathan and Beitien (2021) found that 30% of Singaporeans are confused by sustainability claims. This is supported by the fact that, as medium- to high-income respondents noted, products carrying environmentally friendly labels or claims are still more expensive. Hence, putting the onus of driving more environmentally-friendly food consumption onto consumers has its setbacks.

There is limited availability of more environmentally-friendly palm oil, and consumers find current product information on sustainability confusing. Additionally, with price and promotions significantly determining product choice, more expensive sustainably produced palm oil would struggle to compete. However, the limited agency perceived by consumers, even by those who are aware and more sustainability-minded, should not exclude them from debates. If more brands offer price-competitive sustainably produced palm oil, coupled with transparent and informative messaging that builds consumer trust, it would provide a starting point for more affluent consumers to act, even if only a segment of the population can do so.

Yet, within the current climate of low levels of perceived consumer agency coupled with existing confusion amongst Southeast Asian consumers, does not cultivate an environment where consumers feel they can contribute much to sustainability. This is why many respondents believed that change has to be initiated through a top-down approach. One approach would be for Indonesia's national certification scheme, Indonesia Sustainable Palm Oil (ISPO), to increase its rigor to gain international recognition. Although compliance with ISPO's principles by large-scale farmers and smallholders is required for trade (Dharmawan et al., 2021), its credibility as an internationally recognized certification scheme has been challenged. This stems from perceived vested interests by the government, as well as its inadequacy towards ecological regulations (Hidayat et al., 2018; A. Rival & Levang, 2014; Alain Rival et al., 2016). Nevertheless, as the ISPO already has nationwide relevance, it has the appropriate infrastructure in place which could help mobilize notions of sustainable production in a way that is also attractive to small holders, who may miss out from more prestigious schemes such as the RSPO (Higgins & Richards, 2019). Despite financial and logistical challenges, the implementation of enhanced top-down standards would not only boost the production of sustainably produced palm oil, making it more attractive to local companies, but could also alleviate constrained consumers, by shifting change to higher tiers in the supply chain. These higher levels possess more structural and influential capacity to take and implement action, playing a pivotal role in driving effective sustainability-related changes.

Regardless of the mechanisms used to address environmental issues, whether governmental or private schemes, there remain broader questions concerning Indonesia's transition to sustainably producing palm oil in its current quantities. Concerns were raised about the potential impact that more rigorous sustainability regulations may have on the country's development trajectory, as well as its right to food sovereignty and security, both of which are supported by the palm oil industry. These are important aspects that should be considered when discussing Indonesia's journey towards making its oil palm industry more sustainable. Failure to align the interests of both palm oil-exporting and importing countries will continue to

perpetuate an environment where external sustainability demands are not harmonized with the local context. This misalignment creates leakage effects and loopholes that can be exploited, undermining progress towards achieving shared sustainability goals on both local and global scales.

5.4 Limitations and scope for further research

Although contributing to the consumer and palm oil body of research from an under-explored perspective, this study is not without its limitations. Despite best efforts with both *in situ* verbal and retrospective written translations, it is possible that local linguistic nuances were not fully captured. Nonetheless, as the aim of this exploratory study was to provide an initial overview, it can help compensate for the subtleties that may have been overlooked. Additionally, not only is the nature of qualitative studies such as this one restricted in their extrapolatable potential but the generalizability of these findings to other regions in Indonesia is further reduced given how culinarily diverse Indonesian cuisine and culture is. These different culinary and cultural backgrounds could influence how palm oil is viewed and used in different contexts. Our study was limited to urban consumers in one specific geographic context, yet opinions towards palm oil and its cultivation may differ depending on the distance from plantations. Building on this, future studies can explore how proximity to oil palm plantations and experiences with direct environmental effects resulting from its cultivation influence how this commodity is perceived and how its production can be improved.

6 Conclusions

Found in products ranging from consumables to cosmetics, palm oil is a globally important commodity. While many consumers of palm oil in Western palm oil-importing countries encounter it as an ingredient in products, for consumers in palm oil-producing countries, such as Indonesia, it serves the additional role of being a crucial commodity on both individual and social levels. This study aimed to capture urban Indonesian consumer perspectives, uses and experiences of palm oil on a day-to-day basis, how these change across social stratifications and how its role is being culturally and structurally reinforced. Our focus group discussions revealed several mechanisms at play that facilitate the oil's popularity and fuel consumer inertia regarding its continued use as a cooking oil.

While palm oil as a cooking oil is used across consumer groups, how it is used and the reasons for this are demarcated by social levels. The ever-changing cultural and social food environment, from traditional Indonesian dishes to the growing influence of fast food, creates a shared hunger for taste preferences that extend across affluence. However, for lower-income consumers the role of palm oil in daily life is shaped by cost, predictability and necessity, while better off consumers of palm oil use it more by choice and functional

appropriateness. These degrees of involvement with palm oil influence how much consumer resilience and adaptive creativity are required in response to periods when this commodity is scarce.

Understanding these perspectives sheds valuable light on what local consumers perceive as current barriers as well as the best avenues for action in making the production and consumption of palm oil more sustainable. Environmental policies and actions need to be implemented at levels where the capacity to drive large-scale and meaningful change exists, while being aware of how to combine the structural, physical and cultural geographies of all stakeholders dependent on this vegetable oil, both in Indonesia and abroad. Given that the use of palm oil by urban Indonesian consumers has developed in conjunction with structural drivers, efforts in enhancing the local demand for more sustainable practices need to recognize and be sensitive to the fact that palm oil in Indonesia does indeed hold significance beyond its role as a mere ingredient.

Acknowledgments

A special thanks goes to all the respondents who participated in this study and the Deutsche Forschungsgemeinschaft (DFG) who funded this project through the Research Training Group 2654 Sustainable Food Systems.

Supplementary Material 1:
Focus Group Discussion Outline

1. Welcome
 - a. Introductions of team and participants

2. Briefing
 - a. Briefing on the aims, duration, and output of the project
 - b. Obtain consent from all the respondents

3. Socio-demographic information (collected on back of consent form)
 - a. Gender
 - b. Age
 - c. In which district do you live?
 - d. Which income category do you see yourself in? (Based on average in Bogor)
 - e. Are you the primary person in charge of grocery shopping?
 - f. Are you the primary person in charge of cooking?
 - g. At what type of retailers (traditional markets, corner/convenient stores, supermarkets) do you mostly shop at?

4. Brainstorming activity-
 - a. What comes to your mind when you think of cooking oil? Vegetable oil?
 - i. Why are these associations made?
 - b. What comes to your mind when you think of palm oil?
 - i. Why are these associations made?

5. Thematic exploration of palm oil as a cooking oil:

**NB: While all themes were addressed across the focus group discussions, the exact questions, order and level of depth were adapted and tailored to each income group*

Broad Theme	Prompt
Cultural significance	Could you kindly provide some insights into the connection between palm oil and its relevance to Indonesia and Indonesian culture? Which foods are mostly prepared using palm oil? Why? How do other oils compare to it?
Daily life: palm oil as a cooking oil	Please describe how palm oil relates to your daily life/your household now, and compare this to the past. What role does it play? For what, and in what quantities? How did this come about/where did you learn about the usage of palm oil? What benefits/attributes are most/least useful to you? Why?
Purchase behaviour	Please share a bit about your purchasing habits when it comes to buying palm oil. Where do you buy your oil from?

	Why there, and not elsewhere? Where would you buy it if there were no limiting factors? How often do you purchase oil and in what quantities?
Health	In what ways does palm oil relate to health? Are you aware of any health connotations or aspects related to palm oil consumption? How does this influence your perceptions towards it? Your consumption?
Production	Where is palm oil produced? Why here? Where did you learn about it? What importance does buying Indonesian oil have for you?
Proximity to plantations	Do you have any family, friends or relatives working in oil palm cultivation? What do they do? How do you think oil palm cultivation impacts people living close to them, such as on Jambi, Kalimantan, Borneo etc? How connected do you feel to oil palm plantations? How have these connections shaped your relations to palm oil? In what ways may you be affected by palm oil cultivation? What do you know about the environmental impacts of its cultivation?
Price	Could you please comment on the price of palm oil. How much are you currently paying? What percentage of price increase would you still be willing and capable to pay for the brand/size that you normally buy? How does palm oil compare to other oils? How has this changed? And how have you been impacted by the changes in price?
Brand loyalty	What palm oil brands are you familiar with? Which brands/types and sizes do you buy? How has advertising or the media shaped this? Why does it/or does it not matter which brands you buy? What would it take for you to switch to a different brand? What do you look for in palm oil products?
Ethnocentricity	Please describe how you think the palm oil production impacts Indonesia. What value does palm oil have to Indonesia? The culture? The society? The economy? The environment? How and to whom is this important? What role does palm oil play internationally? Comment on other palm oil producing countries that you know of, and compare this with Indonesia.
Change	Take a moment to think back: how have your perceptions and experiences towards palm oil changed? How do you think international conflicts (such as the Ukraine war) have changed the demand and supply for palm oil? How did you experience the export ban that happened in April 2022? How has the Covid-19 pandemic impacted oil palm cultivation? What do you perceive as the biggest threats to oil palm production? How prepared do you think the industry is to deal with these shocks? How do you think these shocks impact you? Are you concerned? Worried?
Sustainability	Please now take a moment to think of all aspects in how palm oil links to the environment (and then sustainability). In your opinion, how does sustainability link to oil palm cultivation?

	<p>In your opinion, is there a need to make the palm oil industry more sustainable? Why/why not?</p> <p>What needs to happen to put sustainability more in the forefront?</p> <p>What do you know about national or international bodies certifying sustainable palm oil? (ISPO, RSPO)</p> <p>What role do you think these organisations can have in the pursuit of sustainability?</p> <p>What do you think drives the need for sustainability? What type of pressure and where does and should this pressure come from?</p>
--	--

6. Debrief

- a. Thanks, questions, comments, reflections
- b. Compensation and dismissal

References

- Abram, N. K., Meijaard, E., Wilson, K. A., Davis, J. T., Wells, J. A., Ancrenaz, M., Budiharta, S., Durrant, A., Fakhruzz, A., Runting, R. K., Gaveau, D., & Mengersen, K. (2017). Oil palm–community conflict mapping in Indonesia: A case for better community liaison in planning for development initiatives. *Applied Geography*, 78, 33–44. <https://doi.org/10.1016/j.apgeog.2016.10.005>
- Adhikari, S., Poudel, D., & Gopinath, M. (2023). Is Policy Greasing the Wheels of Global Palm Oil Trade? *Research on World Agricultural Economy*, 4(2), 62–77. <https://doi.org/10.36956/rwae.v4i2.859>
- Alkon, A. H., Block, D., Moore, K., Gillis, C., DiNuccio, N., & Chavez, N. (2013). Foodways of the urban poor. *Geoforum*, 48, 126–135. <https://doi.org/10.1016/j.geoforum.2013.04.021>
- Anyanwu, O. A., Naumova, E. N., Chomitz, V. R., Zhang, F.-F., Chui, K., Kartasurya, M. I., & Foltá, S. C. (2022). The Socio-Ecological Context of the Nutrition Transition in Indonesia: A Qualitative Investigation of Perspectives from Multi-Disciplinary Stakeholders. *Nutrients*, 15(1). <https://doi.org/10.3390/nu15010025>
- Arsil, P., Brindal, M., Sularso, K. E., & Mulyani, A. (2018). Determinants of consumers' preferences for local food: A comparison study from urban and rural areas in Indonesia. *Journal of Business and Retail Management Research*, 13(2).
- Arsil, P., Le Dang, H., Wicaksono, R., & Hardanto, A. (2022). Determinants of consumers' motivation towards ethnic food: evidence from Indonesia. *British Food Journal*, 124(10), 3183–3200. <https://doi.org/10.1108/BFJ-05-2021-0605>
- Austin, K. G., Mosnier, A., Pirker, J., McCallum, I., Fritz, S., & Kasibhatla, P. S. (2017). Shifting patterns of oil palm driven deforestation in Indonesia and implications for zero-deforestation commitments. *Land Use Policy*, 69, 41–48. <https://doi.org/10.1016/j.landusepol.2017.08.036>
- Baloch, F. A., Jomezai, N. A., Mohamed, I., & Shaik, A. M. (2020). Food and cultural norms: rural mothers' selection of nutrition intake for their young children. *Health Education*, 120(1), 87–106. <https://doi.org/10.1108/HE-09-2019-0040>
- Baumann, S., Szabo, M., & Johnston, J. (2019). Understanding the food preferences of people of low socioeconomic status. *Journal of Consumer Culture*, 19(3), 316–339. <https://doi.org/10.1177/1469540517717780>
- Blum, L. S., Mellisa, A., Kurnia Sari, E., Novitasari Yusadiredja, I., van Liere, M., Shulman, S., Izwardy, D., Menon, R., & Tumilowicz, A. (2019). In-depth assessment of snacking behaviour in unmarried adolescent girls 16-19 years of age living in urban centres of Java, Indonesia. *Maternal & Child Nutrition*, 15(4), e12833. <https://doi.org/10.1111/mcn.12833>
- Bourdieu, P. (1984). *Distinction: A Social Critique of the Judgement of Taste*. Routledge.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Bryman, A. (2016). *Social research methods (Fifth Edition)*. Oxford University Press.
- Busch, J., Amarjargal, O., Taheripour, F., Austin, K. G., Siregar, R. N., Koenig, K., & Hertel, T. W. (2022). Effects of demand-side restrictions on high-deforestation palm oil in Europe on

deforestation and emissions in Indonesia. *Environmental Research Letters*, 17(1), 14035. <https://doi.org/10.1088/1748-9326/ac435e>

Capecchi, S., Amato, M., Sodano, V., & Verneau, F. (2019). Understanding beliefs and concerns towards palm oil: Empirical evidence and policy implications. *Food Policy*, 89, 101785. <https://doi.org/10.1016/j.foodpol.2019.101785>

Chrisendo, D., Krishna, V. V., Siregar, H., & Qaim, M. (2020). Land-use change, nutrition, and gender roles in Indonesian farm households. *Forest Policy and Economics*, 118. <https://doi.org/10.1016/j.forpol.2020.102245>

Dauda, S. A., Sidique, S. F., Djama, M., Sheng, T. Y., & Hassin, N. H. (2020). Can Protection Motivation Theory Predict Consumer's Behavioural Intention Toward the Choice of Certified Sustainable Palm Oil in Klang Valley Malaysia? *IOP Conference Series: Earth and Environmental Science*, 549, 12085. <https://doi.org/10.1088/1755-1315/549/1/012085>

Dauvergne, P. (2018). The Global Politics of the Business of "Sustainable" Palm Oil. *Global Environmental Politics*, 18(2), 34–52. https://doi.org/10.1162/glep_a_00455

Dharmawan, A. H., Mardiyarningsih, D. I., Rahmadian, F., Yulian, B. E., Komarudin, H., Pacheco, P., Ghazoul, J., & Amalia, R. (2021). The Agrarian, Structural and Cultural Constraints of Smallholders' Readiness for Sustainability Standards Implementation: The Case of Indonesian Sustainable Palm Oil in East Kalimantan. *Sustainability*, 13(5), 2611. <https://doi.org/10.3390/su13052611>

EPOA, IDH, & RSPO. (2022). *Sustainable Palm Oil: Europe's Business Facts, analysis, and actions to leverage impact*.

FAOSTAT. (2023). *Production of Palm oil: top 10 producers*. <https://www.fao.org/faostat/en/#data/QCL/visualize>

Guadalupe, G. A., Lerma-García, M. J., Fuentes, A., Barat, J. M., Del Bas, M. C., & Fernández-Segovia, I. (2019). Presence of palm oil in foodstuffs: consumers' perception. *British Food Journal*, 121(9), 2148–2162. <https://doi.org/10.1108/BFJ-09-2018-0608>

Guest, G., Namey, E., & McKenna, K. (2017). How Many Focus Groups Are Enough? Building an Evidence Base for Nonprobability Sample Sizes. *Field Methods*, 29(1), 3–22. <https://doi.org/10.1177/1525822X16639015>

Harmayani, E., Anal Kumar, A., Wichienchot, S., Bhat, R., Gardjito, M., Santoso, U., Siripongvutikorn, S., Puripaatanavong, J., & Payyappallimana, U. (2016). Healthy food traditions of Asia: exploratory case studies from Indonesia, Thailand, Malaysia, and Nepal. *Journal of Ethnic Foods*, 6(1).

Harris, J. E., Gleason, P. M., Sheean, P. M., Boushey, C., Beto, J. A., & Bruemmer, B. (2009). An introduction to qualitative research for food and nutrition professionals. *Journal of the American Dietetic Association*, 109(1), 80–90. <https://doi.org/10.1016/j.jada.2008.10.018>

Herminingrum, S. (2020). *A cultural Dimension of America-Indonesian 'Fast Food Diplomacy'*. *Humaniora*, 32(1).

Hidayat, N. K., Offermans, A., & Glasbergen, P. (2018). Sustainable palm oil as a public responsibility? On the governance capacity of Indonesian Standard for Sustainable Palm Oil (ISPO). *Agriculture and Human Values*, 35(1), 223–242. <https://doi.org/10.1007/s10460-017-9816-6>

- Higgins, V., & Richards, C. (2019). Framing sustainability: Alternative standards schemes for sustainable palm oil and South-South trade. *Journal of Rural Studies*, 65, 126–134. <https://doi.org/10.1016/j.jrurstud.2018.11.001>
- Hinkes, C., & Christoph-Schulz, I. (2019). Consumer Attitudes toward Palm Oil: Insights from Focus Group Discussions. *Journal of Food Products Marketing*, 25(9), 875–895. <https://doi.org/10.1080/10454446.2019.1693468>
- Ickowitz, A., Rowland, D., Powell, B., Salim, M. A., & Sunderland, T. (2016). Forests, Trees, and Micronutrient-Rich Food Consumption in Indonesia. *PloS One*, 11(5), e0154139. <https://doi.org/10.1371/journal.pone.0154139>
- Kadandale, S., Marten, R., & Smith, R. (2019). The palm oil industry and noncommunicable diseases. *Bulletin of the World Health Organization*, 97(2), 118–128. <https://doi.org/10.2471/BLT.18.220434>
- Kamphuis, C. B. M., Jansen, T., Mackenbach, J. P., & van Lenthe, F. J. (2015). Bourdieu's Cultural Capital in Relation to Food Choices: A Systematic Review of Cultural Capital Indicators and an Empirical Proof of Concept. *PloS One*, 10(8), e0130695. <https://doi.org/10.1371/journal.pone.0130695>
- Liamputtong, P. (2010). *Performing qualitative cross-cultural research*. Cambridge University Press.
- Lieke, S.-D., Spiller, A., & Busch, G. (2023). Can consumers understand that there is more to palm oil than deforestation? *Sustainable Production and Consumption*, 39, 495–505. <https://doi.org/10.1016/j.spc.2023.05.037>
- Liu, F. H. M., Ganesan, V., & Smith, T. E. L. (2020). Contrasting communications of sustainability science in the media coverage of palm oil agriculture on tropical peatlands in Indonesia, Malaysia and Singapore. *Environmental Science & Policy*, 114, 162–169. <https://doi.org/10.1016/j.envsci.2020.07.004>
- Mancini, P., Marchini, A., & Simeone, M. (2017). Which are the sustainable attributes affecting the real consumption behaviour? Consumer understanding and choices. *British Food Journal*, 119(8), 1839–1853. <https://doi.org/10.1108/BFJ-11-2016-0574>
- Mardatillah, A., Raharja, S. J., Hermanto, B., & Herawaty, T. (2019). Riau Malay food culture in Pekanbaru, Riau Indonesian: commodification, authenticity and sustainability in a global business era. *Journal of Ethnic Foods*, 6(3).
- Meijaard, E., Brooks, T. M., Carlson, K. M., Slade, E. M., Garcia-Ulloa, J., Gaveau, D. L. A., Lee, J. S. H., Santika, T., Juffe-Bignoli, D., Struebig, M. J., Wich, S. A., Ancrenaz, M., Koh, L. P., Zamira, N., Abrams, J. F., Prins, H. H. T., Sendashonga, C. N., Murdiyarsa, D., Furumo, P. R., . . . Sheil, D. (2020). The environmental impacts of palm oil in context. *Nature Plants*, 6(12), 1418–1426. <https://doi.org/10.1038/s41477-020-00813-w>
- Moreno-Peñaranda, R., Gasparatos, A., Stromberg, P., Suwa, A., Pandyaswargo, A. H., & Puppim de Oliveira, J. A. (2015). Sustainable production and consumption of palm oil in Indonesia: What can stakeholder perceptions offer to the debate? *Sustainable Production and Consumption*, 4, 16–35. <https://doi.org/10.1016/j.spc.2015.10.002>
- Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, 9(1), 20–32. <https://doi.org/10.1111/2041-210X.12860>

- Oncini, F. (2019). Feeding distinction: Economic and cultural capital in the making of food boundaries. *Poetics*, 73, 17–31. <https://doi.org/10.1016/j.poetic.2019.02.002>
- Parsons, S., Raikova, S., & Chuck, C. J. (2020). The viability and desirability of replacing palm oil. *Nature Sustainability*, 3(6), 412–418. <https://doi.org/10.1038/s41893-020-0487-8>
- Raghunathan, R., & Beitien, S. (2021). Sustainability in Singapore- Consumer and Business Opportunities.
- Rheinländer, T., Olsen, M., Bakang, J. A., Takyi, H., Konradsen, F., & Samuelsen, H. (2008). Keeping up appearances: Perceptions of street food safety in urban Kumasi, Ghana. *Journal of Urban Health : Bulletin of the New York Academy of Medicine*, 85(6), 952–964. <https://doi.org/10.1007/s11524-008-9318-3>
- Rptiono, S., Irma Anggraeni, A., Suroso, A., & Nur Azizah, S. (2020). Intention to purchase local food products among Indonesian young consumers I. *Humanities & Social Sciences Reviews*, 8(4), 1285–1294. <https://doi.org/10.18510/hssr.2020.84121>
- Rival, A, & Levang, P. (2014). *Palms of controversies- Oil palm and development challenges*. Center for International Forestry Research.
- Rival, A, Montet, D., & Pioch, D. (2016). Certification, labelling and traceability of palm oil: can we build confidence from trustworthy standards? *OCL*, 23(6), D609. <https://doi.org/10.1051/ocl/2016042>
- Rizkalla, N., & Setiadi, D. D. (2022). Appraising the influence of theory of consumption values on environmentally - friendly product purchase intention in Indonesia. *Management and Marketing*, 18.
- Rojas-Rivas, E., Espinoza-Ortega, A., Thomé-Ortiz, H., & Cuffia, F. (2022). More than words! A narrative review of the use of the projective technique of word association in the studies of food consumer behavior: Methodological and theoretical implications. *Food Research International*, 156, 111124. <https://doi.org/10.1016/j.foodres.2022.111124>
- Romulo, A., & Surya, R. (2021). Tempe: A traditional fermented food of Indonesia and its health benefits. *International Journal of Gastronomy and Food Science*, 26, 100413. <https://doi.org/10.1016/j.ijgfs.2021.100413>
- Rozaki, Z. (2021). Food security challenges and opportunities in Indonesia post COVID-19. *In Advances in Food Security and Sustainability*, 6, 119–168). Elsevier. <https://doi.org/10.1016/bs.af2s.2021.07.002>
- Rozi, F., Santoso, A. B., Mahendri, I. G. A. P., Hutapea, R. T. P., Wamaer, D., Siagian, V., Elisabeth, D. A. A., Sugiono, S., Handoko, H., Subagio, H., & Syam, A. (2023). Indonesian market demand patterns for food commodity sources of carbohydrates in facing the global food crisis. *Heliyon*, 9(6), e16809. <https://doi.org/10.1016/j.heliyon.2023.e16809>
- Rozin, P. (2005). The meaning of food in our lives: A cross-cultural perspective on eating and well-being. *Journal of Nutrition Education and Behavior*, 37 Suppl 2, S107-12. [https://doi.org/10.1016/s1499-4046\(06\)60209-1](https://doi.org/10.1016/s1499-4046(06)60209-1)
- Rusmawati, E., Hartono, D., & Aritenang, A. F. (2023). Food security in Indonesia: the role of social capital. *Development Studies Research*, 10(1), Article 2169732. <https://doi.org/10.1080/21665095.2023.2169732>

- Santika, T., Wilson, K. A., Meijaard, E., Budiharta, S., Law, E. E., Sabri, M., Struebig, M., Ancrenaz, M., & Poh, T. M. (2019). Changing landscapes, livelihoods and village welfare in the context of oil palm development. *Land Use Policy*, 87, 104073. <https://doi.org/10.1016/j.landusepol.2019.104073>
- Santosa, M., & Guinard, J. X. (2011). Means-end chains analysis of extra virgin olive oil purchase and consumption behavior. *Food Quality and Preference*, 22(3), 304–316. <https://doi.org/10.1016/j.foodqual.2010.12.002>
- Savarese, M., Castellini, G., Paleologo, M., & Graffigna, G. (2022). Determinants of palm oil consumption in food products: A systematic review. *Journal of Functional Foods*, 96, 105207. <https://doi.org/10.1016/j.jff.2022.105207>
- Shigetomi, Y., Ishimura, Y., & Yamamoto, Y. (2020). Trends in global dependency on the Indonesian palm oil and resultant environmental impacts. *Scientific Reports*, 10(1), 20624. <https://doi.org/10.1038/s41598-020-77458-4>
- Sibhatu, K. T. (2023). Oil palm boom: its socioeconomic use and abuse. *Frontiers in Sustainable Food Systems*. *Advance online publication*. <https://doi.org/10.3389/fsufs.2023.1083022>
- Statistics Bogor City. (2017). *Population by Age Group and Sex in Bogor City, 2017*. <https://bogorkota.bps.go.id/statictable/2018/10/03/188/jumlah-penduduk-menurut-kelompok-umur-dan-jenis-kelamin-di-kota-bogor-2017.html>
- Sundaraja, C. S., Hine, D. W., Thorsteinsson, E. B., & Lykins, A. D. (2022). Purchasing products with sustainable palm oil: designing and evaluating an online intervention for Australian consumers. *Australian Journal of Environmental Education*, 1–18. <https://doi.org/10.1017/aee.2022.27>
- Teuscher, M., Vorlaufer, M., Wollni, M., Brose, U., Mulyani, Y., & Clough, Y. (2015). Trade-offs between bird diversity and abundance, yields and revenue in smallholder oil palm plantations in Sumatra, Indonesia. *Biological Conservation*, 186, 306–318. <https://doi.org/10.1016/j.biocon.2015.03.022>
- Tyson, A., Varkkey, H., & Choiruzzad, S. (2018). Deconstructing the Palm Oil Industry Narrative in Indonesia: Evidence from Riau Province. *Contemporary Southeast Asia*, 40(3), 422–448.
- Utomo, A. J. (2015). Gender in the Midst of Reforms: Attitudes to Work and Family Roles among University Students in Urban Indonesia. *Marriage & Family Review*, 52(5), 421–441. <https://doi.org/10.1080/01494929.2015.1113224>
- Vijay, V., Pimm, S. L., Jenkins, C. N., & Smith, S. J. (2016). The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss. *PloS One*, 11(7), e0159668. <https://doi.org/10.1371/journal.pone.0159668>
- Wertheim-Heck, S. C., Vellema, S., & Spaargaren, G. (2015). Food safety and urban food markets in Vietnam: The need for flexible and customized retail modernization policies. *Food Policy*, 54, 95–106. <https://doi.org/10.1016/j.foodpol.2015.05.002>
- Wijaya, S. (2019). Indonesian food culture mapping: a starter contribution to promote Indonesian culinary tourism. *Journal of Ethnic Foods*, 6(1). <https://doi.org/10.1186/s42779-019-0009-3>

- World Bank Open Data. (2023, June 27). *World Bank Open Data*.
https://data.worldbank.org/indicator/SP.POP.TOTL?most_recent_value_desc=true
- WWF. (2021, September 27). *Launching Sustainable Cooking Oil in Indonesian Supermarket* [Press release]. <https://www.wwf-scp.org/sustainable-cooking-oil-indonesia/>
- Zorba, N. N. D., & Kaptan, M. (2011). Consumer food safety perceptions and practices in a Turkish community. *Journal of Food Protection*, 74(11), 1922–1929.
<https://doi.org/10.4315/0362-028X.JFP-11-126>
- Zulkipli, S. H., Balasubramaniam, V., Abu Bakar, N. A., Abd Rashed, A., & Ismail, S. R. (2019). Effects of palm oil consumption on biomarkers of glucose metabolism: A systematic review. *PloS One*, 14(8), e0220877. <https://doi.org/10.1371/journal.pone.0220877>