NTU, HAZE & YOU: How do NTU canteens use oil?
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Executive Summary
To reduce climate change, we should save our peatlands. As a consumer, we can do so by using RSPO-certified palm oil instead of uncertified palm oil in our cooking. To scale up our impact, Breathe Easy NTU and PM Haze are targeting NTU canteens.

A survey was conducted in Sept-Oct 2018 in NTU eateries to find out how vendors felt about their oil usage and whether they are open to changing their oil supplier. This report details the findings.

**Key Statistics**

- **81%** of vendors used palm oil in their cooking.
- **91%** of palm oil had halal certification. Of the 91%, 18% had healthier choice and 3% had RSPO labelling (1 store)
- **3** main reasons for choosing that brand: price, health reasons, and authority (boss determines it)
- **3** main reasons vendors will change their oil: cost, quality, and health.
- **$1** price difference between RSPO-labelled oil and non-labelled oil.
- **0** long-term contracts with suppliers (although there are partnerships)

Overall, vendors were willing to change if the price and quality of the oil are not affected. We should work together with the school administration to consolidate oil orders to lower prices and make the switch.
**Introduction**

Palm oil is a very common vegetable oil used in cooking. However, the production of palm oil can be unsustainable, causing deforestation and haze. Given that almost 75% of palm oil produced is used in food products (Meijaard, 2018) and a large part of it is used for cooking oil (Abdullah Datuk, n.d.), a good strategy to reduce the impacts of palm oil is to use sustainable cooking oil.

Thus, PMHaze and Breathe Easy NTU are advocating for sustainable cooking oil in NTU. Previously, to gather more data about the current situation, a survey was done to see if the school population was receptive to sustainable palm oil (PMHaze, July 2018). This time, as a follow up, the canteen vendors were surveyed.

The goal of this canteen vendor survey is to understand the current cooking oil situation, and to understand what would persuade them to change the oil. We would need the support of all stakeholders to make lasting change.

**Methodology**

In-person surveys were conducted, where we visited the vendors one by one at their stalls to ask questions. We obtained 44 vendor responses over a period of about two weeks (25 Sept – 7 Oct 2018). We visited all the canteens in NTU, and within each canteen, we picked a few vendors to survey. The number of vendors chosen was proportionate to the size of the canteen (where possible). For example, bigger canteens such as the North Spine canteen (or Canteen A) would have more vendors surveyed than smaller canteens. Of the 44 vendors surveyed, three were restaurants located in NTU.

**Results**

The questions have been edited for readability. The original questions can be found in Appendix A.

**Which vendors did we survey?**

We visited all the canteens and three restaurants that were in operation at that time in NTU. We then picked about one third of the canteen vendors in each canteen to survey, depending on their availability to be interviewed.

For the canteen at the Quad, only one vendor was surveyed, since one vendor controlled the oil supply of the whole canteen. The case was similar for Canteen 16. For the other canteens, each vendor controlled their own oil supply.

However, we did not manage to get enough information for Canteen 16. Thus, Canteen 16 will be omitted from all analysis in the later sections. For other vendors, the information provided was not always complete. Thus, only vendors with responses are included in each question’s analysis.
What type of oil is used in cooking?

42 vendors provided answers to this question. Four canteen vendors used multiple types of oil. Of the four, three used other oils in conjunction with palm oil. The remaining vendor did not use palm oil at all. Some oil types were left as “Vegetable Cooking Oil” because we could not find the ingredients of the oil. Sometimes, this is because we missed it out while asking the vendors; other times, it is because some tins do not list the oil ingredients beyond “Vegetable Oil” at all. A possible reason is because in Singapore, terms like “vegetable oil” and ‘vegetable fat” can be used without mentioning that it is palm oil (Lim, 2015).

About 81% of vendors used some form of palm oil in their cooking.
Figure 2: Oil used in cooking. “Mix (C)” and “Mix (S)” refers to palm oil mixed with canola or sunflower oil respectively (in one oil), while “Palm, Soybean” refers to the use of both palm oil and soybean oil (two separate oils). “P, O, Co” refers to the use of palm, olive and corn oil (three separate oils). “Mix (C), S” refers to the use of both palm oil mixed with canola (one oil) and sesame oil (another oil).

If the oil used is a mix between palm oil and other oils, roughly how many % is palm oil?

We did not manage to get meaningful data on this. The labels were not clear on the proportion for mix oil. When we tried to derive the proportion from the nutrition labels, it proved impossible because the nutritional values found on the cans for pure palm oil differed greatly as well.
Which brand of palm oil is used?

Note: From this question onwards, since we are only interested in palm oil, the data on other types of oil was excluded.

Sometimes, vendors will change brands if their usual supply of palm oil runs out. We are also not sure if some of the different brands belong to the same overall company or supplier. The information is surprisingly hard to find online.

One store used both Golden Circle and Hee Tat, while another used both MONA and Imperial brand. The other stores used only one brand for palm oil.

Figure 3: Palm oil brands used in NTU. The inner circle represents the main brand; the outer circle represents the sub-brands used on the oil tin packaging (if they differ from the main brand).
As can be seen, the brands used vary quite a lot, with the most popular brand, GHL, used in only 6 of the 34 vendors who used palm oil in their cooking and provided data for the survey. This is roughly 18%.

**Certification (if any)**

This question was to find out what sort of certification the palm oil has. More sustainable replacements for palm oil would likely need to meet these certification requirements. Data from 34 vendors were aggregated.

![Certification Chart]

*Figure 4: Certification present for the oil used in NTU.*

Only one vendor is currently using RSPO oil (mix).

All the brands with certification have at least the halal certification. This covers roughly 91% of all oil used in NTU. About 18% of all the oil is also labelled as “Healthier Choice”, either directly on the oil tin or on the glass storefront of the canteen store. Finally, one of the halal-certified oils also has the RSPO oil (mix) – or, RSPO mass balance (Roundtable on Sustainable Palm Oil [RSPO], 2016) – label. The brand is **Sailing Boat, by Lam Soon**. This puts the penetration rate of RSPO oil among palm oil users in NTU at about 3%.
The current recommended vendors list curated by PM Haze does not specify whether the vendors listed are halal or not (PMHaze, 2016). It'd be great if the information was updated to include this as well, given that the halal certification is important for palm oil tins in Singapore.

Why do the vendors use the current brand of oil?
We asked the vendors how they decided on their current brand of oil. 26 vendors who use palm oil in their cooking responded. Some vendors gave multiple answers. Each reason was counted as a separate data point.

![Chart](Figure 5: Percentage values of responses that contained each reason.)

As can be seen, authority, price and health are the three main factors affecting brand choice, making up roughly 20% of the responses each.

We found it interesting that the government provides a subsidy for healthier oil (according to the vendor). Perhaps a similar subsidy can be considered for sustainable palm oil.

Who decides the brand of the oil?
Next, we asked the vendors about who decides the brand of the oil. Overwhelmingly, the boss of the store was the one who decides. There was one vendor where the supplier decides on the brand.

Contact details of the one who decides
Of the 44 stores total (including non-palm oil users), we obtained 11 contact points (25%). The vendors seem to prefer face-to-face interaction. Furthermore, they may not be able to provide the contact details of their boss.
How often do the vendors get oil?
This question was asked to estimate the amount of oil used in the canteens, and how quickly we can get the supply to change. Some vendors found it hard to estimate the oil they used, because they were not the ones who bought the oil. We obtained 19 responses.

![How often do you get oil?](image)

*Figure 6: How frequently the vendors get oil.*

This shows that it should be quite easy to change the oil supply, since it is refreshed once or twice per week or whenever it runs out, with no fixed supplier.

9 vendors also gave concrete estimates of oil use per week. Each week, the average tin use was 4.64 tins per week. Multiplied by the average weight of the oil tins (obtained from the pictures of the oil tins we took), we estimate that each vendor uses about 71 kg of oil per week. Given that we have over 100 canteen vendors in NTU, it would be possible to consolidate the demand to negotiate for a lower price with the suppliers. Thus, while it may be hard for individual vendors to switch suppliers, it could be possible for all vendors to switch to sustainable palm oil at once.

Do vendors have existing contracts with suppliers? If yes, describe conditions (must buy X amount, must buy for a specific amount of time)
This question was asked to determine if we would need to renegotiate existing supplier contracts. Thankfully, there do not seem to be existing contracts. Interestingly, for one vendor, the brand of the oil changes according to the supplier.

That being said, oil is sometimes bundled together with other staples. Of the 8 vendors who have such bundles, all 8 buy rice together with oil. On top of that, four of those vendors have other items bundled as well, although each one of them bundles the rice and oil with a different item.
Figure 7: Various packages vendors have with suppliers.

About 18\% of our whole dataset of vendors have such packages. Thus, suppliers offering RSPO-certified oil can consider bundling it with such staples to attract more customers.

How much does the oil cost per kg?

We wanted to estimate the cost of the oil to see if RSPO-labelled oil can be price-competitive, given that price is still the leading factor in deciding what oil to use.

Some vendors gave only estimates of prices, such as “20 or more” or “30 or more” dollars. In these cases, the price is assumed to be $23 and $33 per tin respectively. For vendors who give a range such as $25-$30, we take the middle of the range, $27.50, as the price used. The price is assumed to contain 7\% GST.

The net weight (weight of the oil only, excluding packaging) was obtained from pictures of the oil tins. Gross weights with no net weight printed on the tin are assumed to have a net weight of one kilogram less than the gross weight. This is because for the tins with both net weight and gross weight printed, the net weight is commonly one kilogram less than gross weight.

Then, we divide the total cost of each tin of oil by the net weight of each tin.

In addition, some vendors were unwilling to provide prices, or the weight of oil could not be determined. We also excluded the mixed types of oil and focused on pure palm oil. This would give a better comparison of uncertified palm oil against RSPO oil. 19 data points were used to calculate the price. We found that the average price of the palm oil used is about $1.50 per kg.
Has the store changed oil supplier before? If so, why, when, and how many times? The goal of this question is to see what factors have triggered change before, so that we can use them to perhaps trigger another change to sustainable palm oil. We gathered responses from 20 vendors.

![Figure 8: Responses by vendors about supplier change.](image)

As can be seen, about 55% of vendors have never changed their supplier before. 2 vendors mentioned that while their supplier does not change, the brand of oil used might, depending on the supplier.

The rest of the changes were usually caused by cost, health and convenience factors. This is similar to the reasons why a particular palm oil brand is used (Figure 5). Thus, cost, health (usually referring to the healthier label) and convenience can be drivers used to switch vendors over to Sustainable Palm Oil.

**General business challenges and desired improvements**

We asked the canteen vendors about their challenges to get a sense of the problems we might be able to help them with. If we can solve another problem when we switch to RSPO-certified oil, then we can present a more convincing case to the vendors. We obtained 10 responses among all the vendors we surveyed (including those that did not use palm oil).
As can be seen, the top two challenges are cost-related issues. Thus, cost would be a good way to influence vendors to change to sustainable palm oil.

What would make vendors change their oil supplier?
More explicitly, we asked the vendors to imagine changing their oil supplier, and the reasons why. We obtained 18 responses. Some vendors provided multiple reasons; each reason is counted separately.

As can be seen, cost, quality and health factors top the reasons, which is similar to the results found in Figure 5. As such, these factors are good leverage points to open a future conversation with canteen vendors about palm oil.
Conclusion

In summary, vendors were willing to change their oil supplier if price not an issue. Currently, each canteen vendor sources for ingredients on their own (except for the Quad canteen). Thus, if we can consolidate the vendor orders for oil, we may be able to get a good price from the suppliers who provide RSPO-certified oil. This should be possible given the large volume of orders and the small price difference ($1 for 18 kg or, 5.56 cents per kg) (PMHaze, February 2018). We should make sure the oil brand is halal-certified, and if possible, contains the healthier-choice label as well.

We noticed that some vendors were using Malaysian oil. If the oil is Malaysian, it might not be as detrimental as Indonesian oil, because the palm oil plantations replace existing rubber plantations instead of forested land or peat (Bruce, 2017). Nevertheless, given the fast pace that the palm oil market is growing, we would need to be careful about certification so that we preserve Malaysia’s remaining forests and peatlands as much as we can.

As a leading sustainable campus in the world, switching our canteens to RSPO-certified palm oil is one small step we can take that can have a large and long-term impact. It only must be done once, and as long as we keep up good supplier relations, we can ensure that NTU does not contribute to the haze in Southeast Asia. By thinking about our supply chain and how we can improve it, we can nudge ourselves – and our global community – towards a greener world.
References


Appendix A – Survey Questions

The survey was hosted on Google Forms, and was designed as an interactive ‘script’ that will change depending on the response from the vendors.

The survey took around 5-10 minutes to complete.

Vendors Survey

Hey guys! Thank you for helping :))

Contact person: Jia Yang [redacted] or [redacted]

Fill in this section before approaching vendor.

Volunteer’s Name (& Buddy’s Name): _______

Store Name (for Canteens): _______

Canteen/Restaurant Location:

1. North Spine
2. South Spine
3. Quad
4. Can 1
5. Can 2
6. Can 4
7. Can 9
8. Can 11
9. Can 13
10. Can 14
11. Can 16
12. NIE
13. North Hill
14. Tamarind
15. Crespion
16. Co-Op at The Hive
17. SPMS cafe
18. Thai @ WKWSCI
19. Cosmo Bar & Coffeeworks (Campus Clubhouse)
20. Spruce Bistro @ North Hill
21. Ananda Kitchen @ North Hill
22. Other

If other, please specify: _______

Eatery type:

1. Restaurant
2. Snack store
3. Canteen food/drink store
4. Other:

Oil Usage

Hello Auntie/uncle! Do you have a few minutes?

We’re a group of students doing an environment project. We are interested in your cooking oil use to know if you’ll be open to changing it to a more sustainable one.

What you tell us will be anonymised. We may publish the results in a report. You can let us know if you do not want your answers to be published at all.

Can I borrow a few minutes of your time?

"Can we see the cooking oil tin? Can we take a photo?"
What type of oil?

1. Palm/Palm Olein
2. Non-palm
3. Mix
4. Other: _____

If mix, roughly how many % is palm oil? ________________

Which brand of palm oil is used?

1. Oki
2. Cabbage
3. Hand Brand
4. Golden
5. New Moon
6. Chief
7. JCQ Gold
8. Naturel
9. Bello
10. Other:

Certification (if any):

1. Healthier Choice
2. RSPO
3. Other:

Why do you use the current brand of oil?

1. Cheap
2. Friends with suppliers
3. Healthy
4. Always using this brand, no need to change/Out of habit
5. Boss says so
6. Environmentally friendly
7. Don't know
8. Other:

"Who decides the brand of the oil?" ___________

"Is he/she here today?"

1. Yes
2. No

If yes:

"Can we speak to him/her?"

1. Yes
2. No
If yes:
"Can I get your name?" ________
Number: ________
Email: ________

If not here/Busy:
"Can we get that person's name?"
"When would be a good time to talk to [name]?"
Number: ________
Email: ________

Oil Usage (Cont'd)

If another person decides the oil use and is available, talk to that person instead. Otherwise, see what info we can get from our current interviewee.

How often do you get oil?

1. Daily
2. Weekly
3. Fortnightly
4. Monthly
5. Don't Know
6. Other:

Do you have existing contracts lasting eg 1-2 years with suppliers? If yes, describe conditions (must buy X amount, must buy for how long): __________________

If they don't know, tick 'don't know' and ask them to estimate (put into 'other')

1. Don't Know
2. Other:

How much does it cost per tin/litre? State units: ________

If they don't know, tick 'don't know' and ask them to estimate (put into 'other')

1. Don't Know
2. Other:

Has the store changed oil supplier before? If so, why, when, and how many times? ________

If they don't know, tick 'don't know' and ask them to guess (put into 'other')

1. Don't Know
2. Other:

What would make you change your oil supplier?

1. Cost
2. Healthier Label
3. Other:

[skip if unfriendly/no time] Last question, we also want to understand our canteen vendors better in general :) What are some challenges you are facing in your business? What is one improvement you would like to see running a business here? ________________

Upload oil photo (up to 5).

**Appendix B – What went well and what can be improved**

To provide a fuller picture of how the data collection went, and as a reference for future projects, we also present some reflections on the experience.

**What went well?**

We tested the survey once before we approached canteen vendors, which helped us tweak our survey more.

The vendors were generally happy to answer our questions. Some of the vendors can only speak Malay or Chinese, and with the help of volunteers, we could switch to those languages when needed. The volunteers were also quite enthusiastic about the project. To our surprise, each survey took less time than expected to complete as well.

Our timing was good as well. The surveys were conducted on weekends and during the school break. This meant that we could talk to the vendors freely and at length.

Our sample size was also rather large, given that it was roughly one third of the total number of vendors in NTU. Thus, the results collected should be quite representative of all canteen vendors in NTU.

**What can be improved?**

The survey design could have been improved, especially for contact details. The question should be shifted to the back for better flow. We also had multiple pages for the survey, which was disruptive. It would be easier if the survey was in one continuous page.

Additionally, in approaching the vendors, we tended to open with “Hi, can you answer some questions for me?”. Instead, something like “Hi, we’re doing a project on the oil canteens use, could you help us out?” might have been better. We could test different approaches to see which one works best. The suggested script in the survey could have been shortened to make it more useful, and we should have practiced pitching the idea of ‘sustainable palm oil’ better.

Sometimes, the owner of the store was not available. Thus, some conversations did not prove to be as fruitful. With more time and resources, perhaps we could visit the store again to get a better response.

Regarding volunteers, we had quite limited manpower (5 volunteers in total). More (and earlier) promotion of the project may have fixed this issue.

While each survey took less time than expected, the travelling time between canteens was underestimated. For example, a surveying session that was estimated to be two hours tended to take around two and a half hours to complete instead. More buffer time could have been included, or less ambitious goals (cover fewer canteens in a session) could have been set.

Photos should have been taken to enhance our media presence.