

Consumer Culture Study Award XX 2018 – 2019

Group 2001110142

***McDonald's Food – Is What You Put in
Your Mouth an Illusion?***

你在麥記吃到了什麼？

Research Project Report



Group Leader:

CHAN Wing In S.2

CHAN Kin Hang S.2

CHEUNG Hoi Yi S.2

LAM Yuen Yau S.2

LEUNG Pak Hei S.2

WONG Tsz Fung Nick S.2

YU To Chung Enosh S.2

Teacher Supervisor:

CHOW Kin Sun

Abstract

In advertisements, McDonald's food always looks fresh. Is this true? In reality, McDonald's mostly use processed ingredients for reducing cost. While one eats a piece of Chicken McNugget, does he know what he is eating? Can he absorb the nutrient equivalent to, or at least a portion of, a slice of chicken breast? Does he get what he expect from McDonald's? On the other hand, does McDonald's provide any misleading information to the public?

In this project, survey is done to investigate how McDonald's food is perceived by the public, including their understanding on the cooking process involved. On the other hand, a scientific experiment is also done to verify whether McDonald's official claim on its Chicken McNugget is correct.

Does McDonald's food live up to the expectation of the public? Is the good image in the advertisements just a mixture of illusions? This report is to show the picture of the situation.

Acknowledgement

We would like to express our deepest gratitude to Principal Au for giving us a chance to widen our knowledge. We would also like to thank Mr. Chow, our project supervisor, for his patient guidance, enthusiastic encouragement and useful critiques throughout this research work. We would also like to thank the school's laboratory technician Mr. Chan for providing technical support in our science experiment.

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Introduction

In advertisements, McDonald's food always looks fresh. Is this true? In reality, McDonald's mostly use processed ingredients for reducing cost. To some extent, some food are so heavily processed so that the original form of the fundamental ingredient can no longer be identified. While one eats a piece of Chicken McNugget, does he know what he is eating? Can he absorb the nutrient equivalent to, or at least a portion of, a slice of chicken breast? Does he get what he expect from McDonald's? On the other hand, does McDonald's provide any misleading information to the public?

This project contains 2 parts:

How the public think of McDonald's food? While most people classify that as unhealthy, people keep eating. The reasons behind are also investigated in the project, based on the eating habit and McDonald's marketing strategies.

On the other hand, how McDonald's food is made is also addressed, not only through secondary research but also by scientific experiment.

By comparing the above, the gap between public's perception and actually what they get from McDonald's can be identified.

Aim and Objectives

- Aim
 - The discrepancy between the customer's expectation and the actual food from McDonald's, in terms of the ingredients involved and the nutrition values will be studied. Ultimately, factors leading to the false expectation will be investigated. The reader of the report will be aware of the importance of the choice of food, though some food may look and taste similar.
- Objectives
 - A selection of food will be studied and ranked according to the degree of their discrepancies found through survey. Among those with the highest discrepancies, how they are perceived by the public will be investigated from the various marketing aspects: photos and video in advertisements, together with similar food on the market. On the other hand, the nutrition information provided in the McDonald's homepage will be verified by experiments.

Literature Review

As a restaurant which is reported to have an annual revenue of US\$22.8 billion in 2017, there have been myths about McDonald's food. Here are some of them:

Myths	Validity	Explanation	Source of the Explanation
Putting eyeballs of cows in burgers	False	<i>“Our beef patties are made from 100% Pure Canadian Beef cut from the shoulder, chuck, brisket, rib eye, loin and round. That's it. No fillers, binders or additives.”</i>	Official website of McDonald's, Canada
The shakes are not milkshakes	True	<i>“Our shakes contain milk from our reduced-fat, soft serve, which makes them thick and creamy,”, "Dairy regulations actually vary from state to state on what can officially be called a 'milkshake.' We like to keep it simple and refer to them strictly as 'shakes.’”</i>	A McDonald's spokesperson told Business Insider
McNuggets are made with pink slime (a meat by-product often used as a food additive to ground beef and beef-based processed meats)	False	<i>“All of our Chicken McNuggets are made from ‘actual chicken’, The breast meat is removed from the bird and then mixed together with seasoning prior to forming the Chicken McNuggets”</i>	Official website of McDonald's, South Africa
Burgers do not rot	True	<i>“McDonald's uses thin patties with a lot of surface area, they quickly dry out before they can start to rot.”, similar result for homemade burgers</i>	IFLScience website

There was also a piece of news about complains on McDonald's Chicken McNugget in UK back in 2016.

As there had been rumour saying McNuggets were not made from real chicken, McDonald's UK released a TV ad to “clarify” in 2015. In which a “food tech teacher”, who “knows what 100 per cent chicken meat looks like”, examines a McNugget with a voice-over adding “So now Sarah knows what goes into our McNuggets, everyone's happy” (The TV ad can be found under <https://www.youtube.com/watch?v=1lNEa8R1iNI>).



A screenshot from the TV ad, showing “Food tech teacher” “Sarah” to be very satisfied with the Chicken McNuggets.

This led to some in the public to think that McNuggets are made of “100 per cent chicken meats” which was then not the case. 9 complaints were made.

Although the chiefs at the Advertising Standards Authority (ASA) saying that the TV ad is not misleading technically, McDonald's did as a result confess that McNuggets only had 45 per cent chicken content, with the other 55 per cent being marinade and coating.

This indicates that the food marketing industry quite often gives illusion to the public. Consumers need to be very careful with the ads, or their optimism may lead to a wrong decision on the ordering of food, which eventually goes into stomachs.

Methodology

The discrepancy between public's perception and what they actually get from McDonald's can be identified can be found by

- i. identifying what the public think
 - through background research on web, survey and interview
- ii. confirming how McDonald's food is made
 - through background research on web, interview and scientific experiments

Here is the actual set of actions done:

- Web
 - Background information on how different types of food in McDonald's are prepared.
 - Nutrition information from the McDonald's website
 - Nutrition information on the contrast between the actual food and McDonald's counterpart
- Street survey (Outside McDonald's in Siu Sai Wan, Heng Fa Chuen and Causeway Bay for a wider range of participants: citizens in public housing estates, private housing estate and business district). Questions concerning the followings are included in the questionnaire:
 - Backgrounds of customers
 - Reasons for choosing McDonald's
 - Their understanding and impression of the food they purchase

(refer to appendix 2 for a copy of the questionnaire used)

Siu Sai Wan, Heng Fa Chuen and Causeway Bay are chosen for a wider range of participants.

(refer to appendix 5 for a breakdown of the population composition in the districts)



McDonald's Food – Is What You Put in Your Mouth an Illusion?

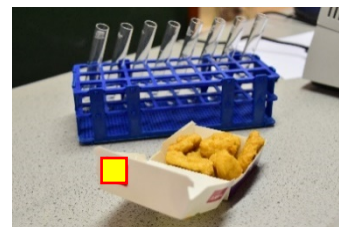
- Verify the ingredient of food as claimed by McDonald's. Due to time constraint, only 1 laboratory test can be done. The protein concentration in Chicken McNuggets is selected as the public is considered to have least information on how this processed food is made.

- Methodology of the experiment on:

- finding the protein concentration in Chicken McNuggets

- Apparatus:

- McNugget
- 100 mL water
- Blender
- Test tube x5
- Container
- Drainer
- Dropper
- Electronic balance

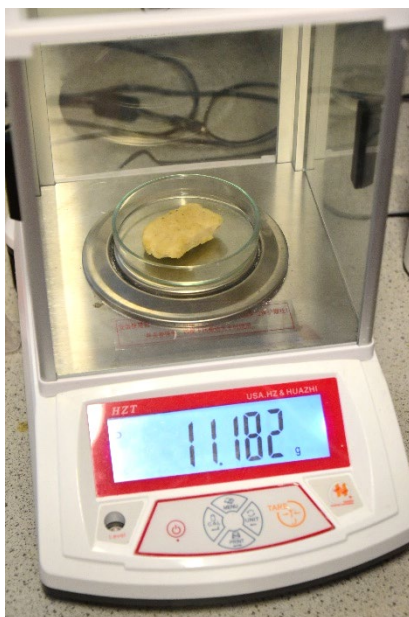


- Procedures:

- 1) Peel away all of the coating of the McNugget



- 2) Weight the remaining McNugget by using an electric balance

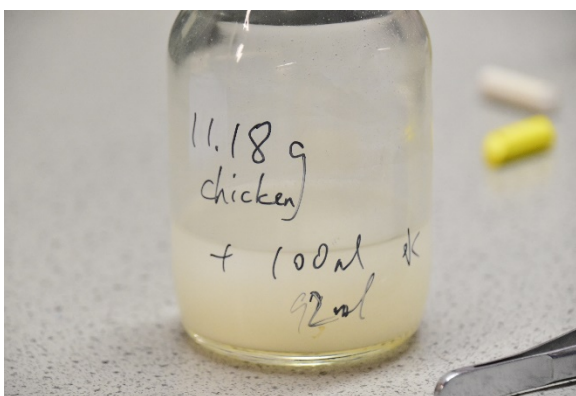


- 3) Use a blender to blend the McNugget together with 100 mL water



McDonald's Food – Is What You Put in Your Mouth an Illusion?

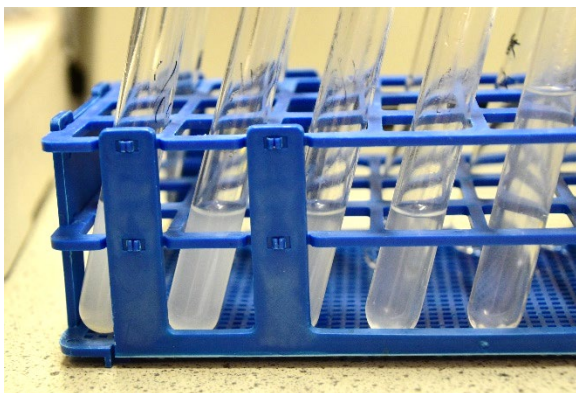
- 4) Use a drainer to remove solid residues and put the McNugget solution into a container. (Original Nugget Solution hereinafter)



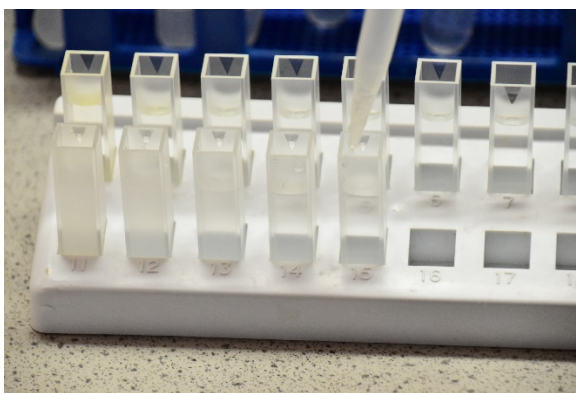
- 5) Put 5 mL of water into each of the 5 test tubes



- 6) Put 5 mL of the Original Nugget Solution into the first test tube, stir and mix 5 mL of these mixture with the water in the second test tube. Repeat this for the remaining test tubes. Resulting 5 test tubes with concentration of the original nugget solution as 50%, 25%, 12.5%, 6.25% and 3.13% respectively.



- 7) Put 3 mL of the diluted Nugget solution from each test tube into a spectrophotometer to test the absorbance of the solution.



- 8) Calibrate the readings with those from standard solution, the amount of protein in the original McNugget can then be calculated.
- Contrast the results from the experiment and McDonald's claim, further compare that with nutrition values of corresponding natural food, i.e. chicken breast listed on the web. The maximum percentage of chicken muscle can be estimated.

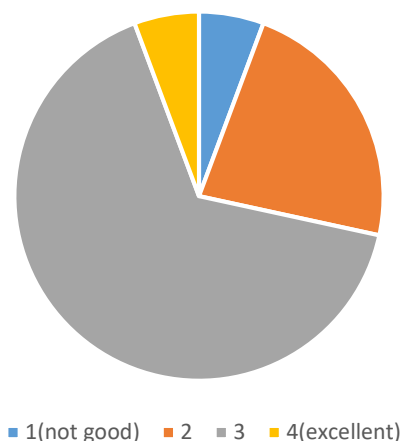
Result Analysis

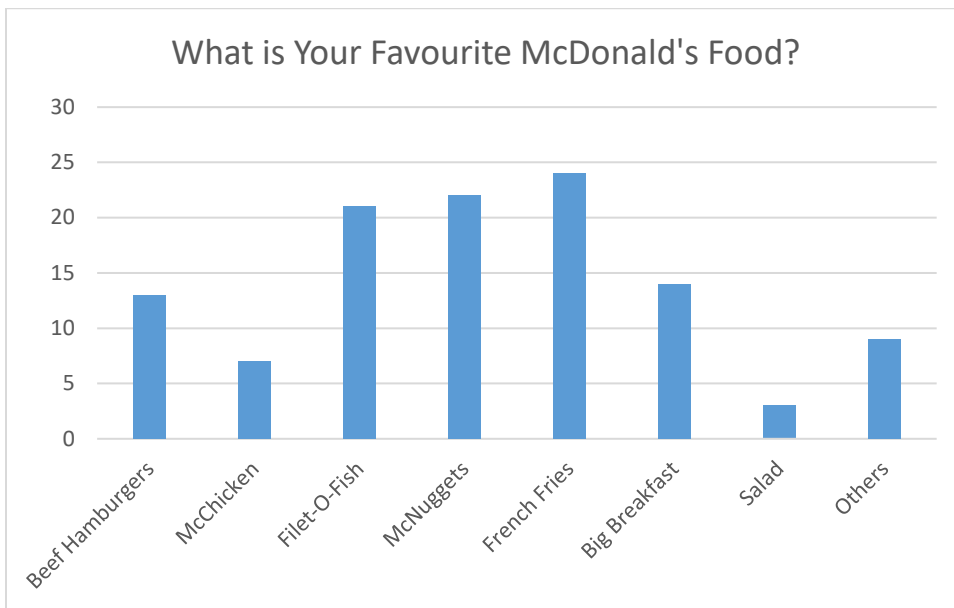
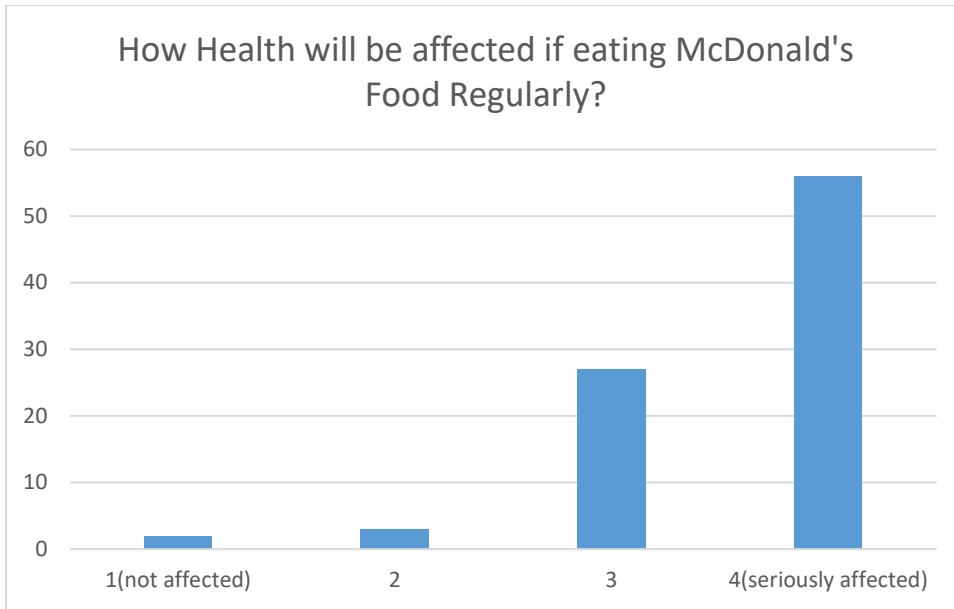
- Street survey (Outside McDonald's in Siu Sai Wan, Heng Fa Chuen and Causeway Bay)

A survey was conducted on 6th November 2018, about people's understanding on how McDonald's food is made near a McDonald's Restaurant in Siu Sai Wan (11:00 – 12:15), Heng Fa Chuen (13:00 – 14:15) respectively, and Sogo department store (14:45 – 16:00) in Causeway Bay. A total of 88 people took part in the survey. The raw data from the survey can be found in appendix 3, whereas the corresponding graphical representation of each question is in appendix 4. The highlight is as follows:



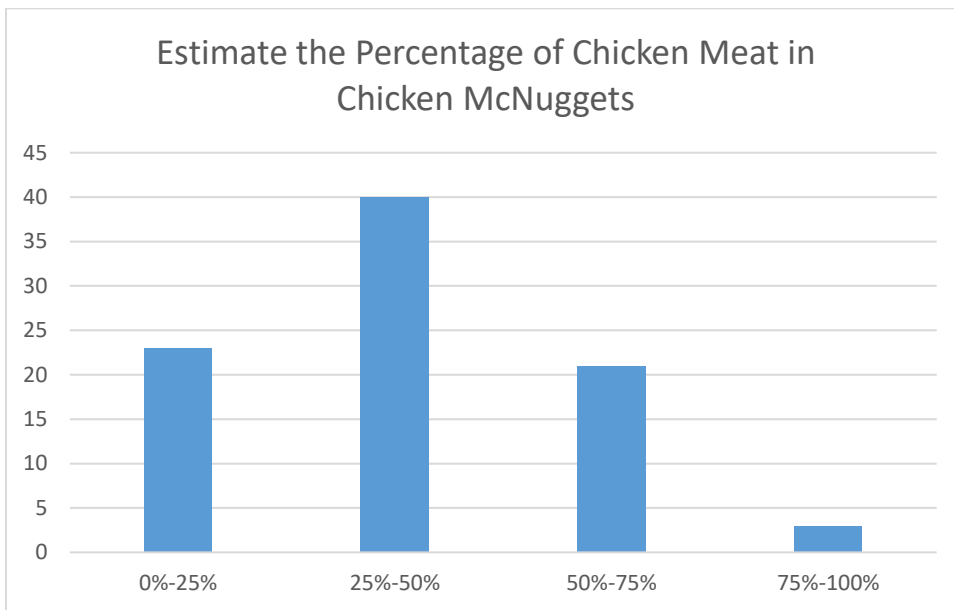
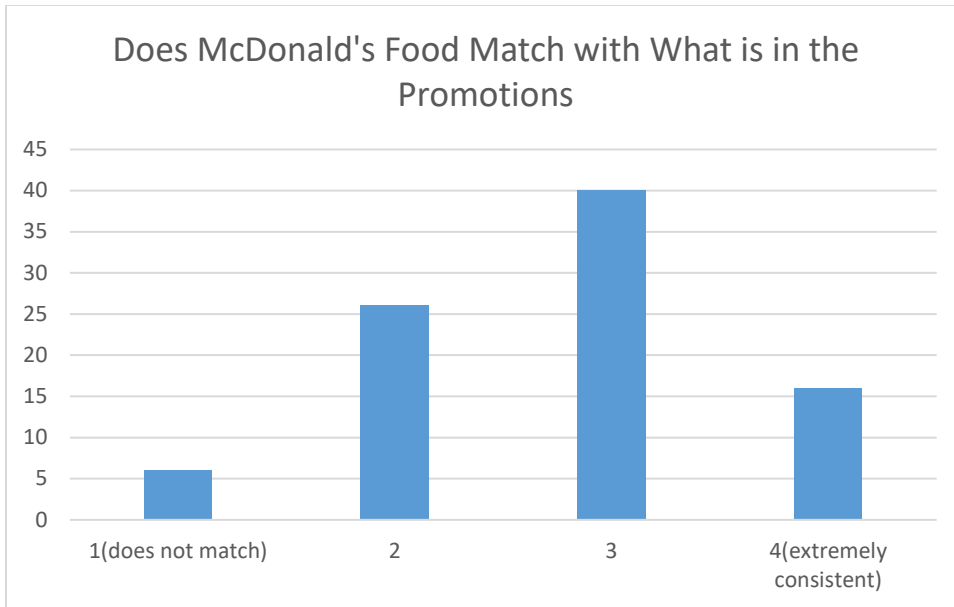
What do you think about the food quality of McDonald's



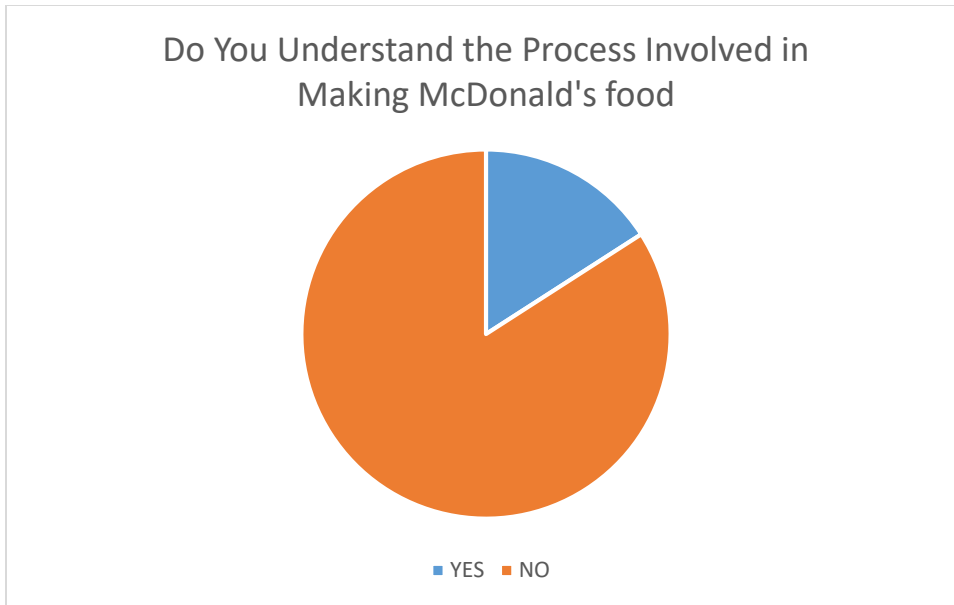


The 3 graphs above indicates that the public thinks McDonald's food is of fair quality in general, 64% also think their health would be seriously affected if having McDonald's regularly, with fries and Chicken McNuggets being their favourite.

McDonald's Food – Is What You Put in Your Mouth an Illusion?



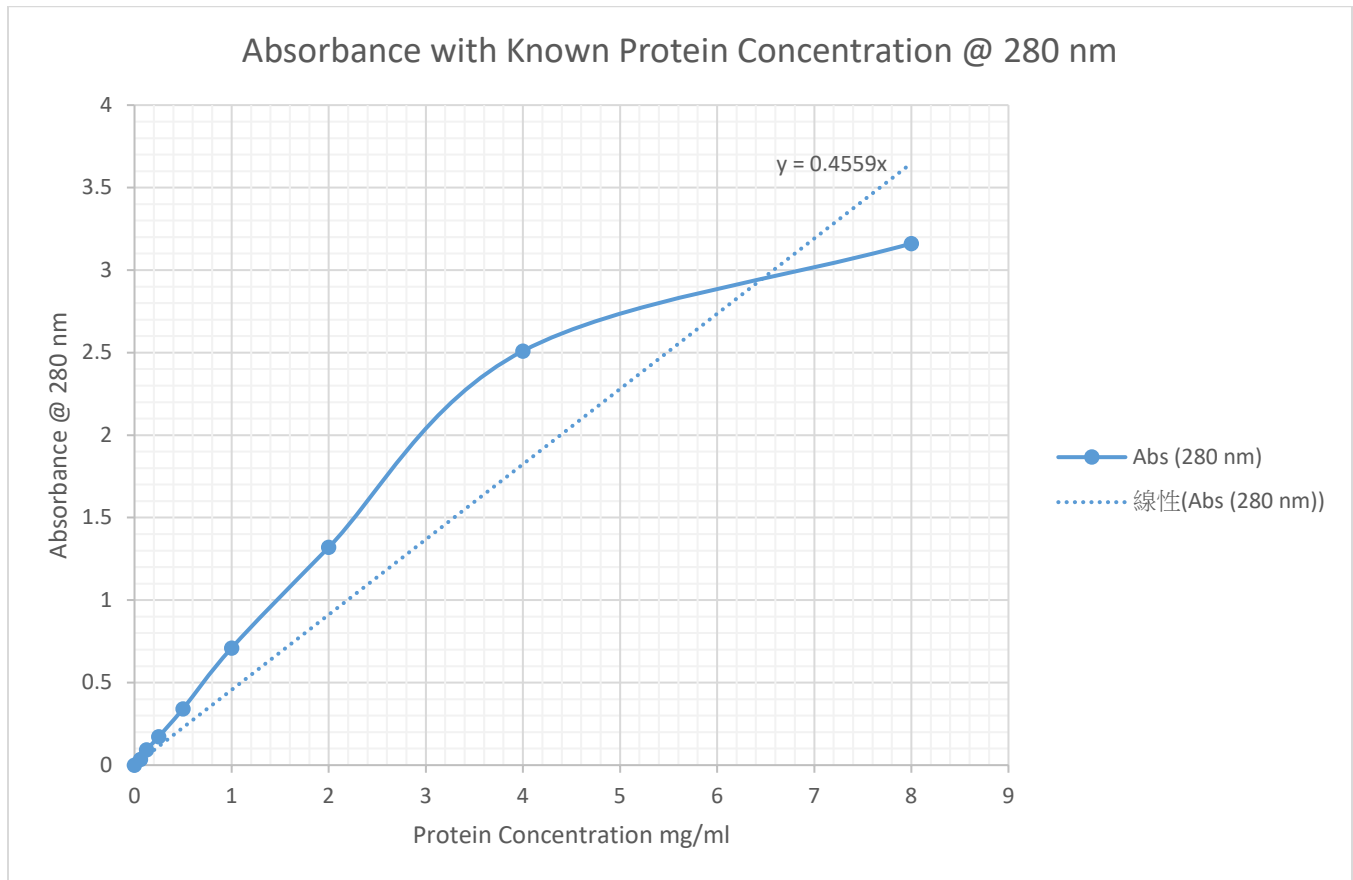
From the 2 graphs above, with 64% people (choosing 3 or 4) think the food matches with how they are promoted, 46% think the amount of chicken meat within Chicken McNuggets to be between 25% to 50%, which matches with the 45% claim made by McDonald's UK.



Lastly, 16% of people claim to understand the process involved when preparing McDonald's food. Whether McDonald's has done a good job in promoting its food is questionable.

McDonald's Food – Is What You Put in Your Mouth an Illusion?

- Verify McDonald's Claim on the protein concentration in Chicken McNuggets through a scientific experiment
 - The absorbance @280 nm of the standard solution is plot against the protein concentration.



- By drawing the line of best fit, the relationship between absorbance and protein concentration is found to roughly follow the equation:

$$\text{Protein Concentration} = \text{Absorbance} \times 0.4559$$

- Column (b) in Table 1 below lists out the reading from the spectrophotometer. By using the equation above, the respective protein concentration of the diluted Nugget solution can be found (column (c)).

(a)	(b)	(c)	(d)	(e)	(f)
Concentration of the Original Nugget Solution	Absorbance Measured	Protein Concentration of the Diluted Nugget Solution (mg/l)	Equivalent Protein Concentration of the Original Nugget Solution (mg/l)	Approx. mass of Protein per Piece of McNugget (g)	Approx. % of Protein in the Original McNugget
50%	2.92	6.405	12.810	1.2810	11.458
25%	1.69	3.707	14.828	1.4828	13.263
12.50%	0.87	1.908	15.267	1.5267	13.655
6.25%	0.72	1.579	25.269	2.5269	22.602
3.13%	0.22	0.483	15.442	1.5442	13.812

- The preparation of the original Nugget Solution:



mix with



minus residue = 92 g of the Original Nugget Solution

McNugget

100 g of water

(coating removed)

- Equivalent Protein Concentration of the Original Nugget Solution (d)

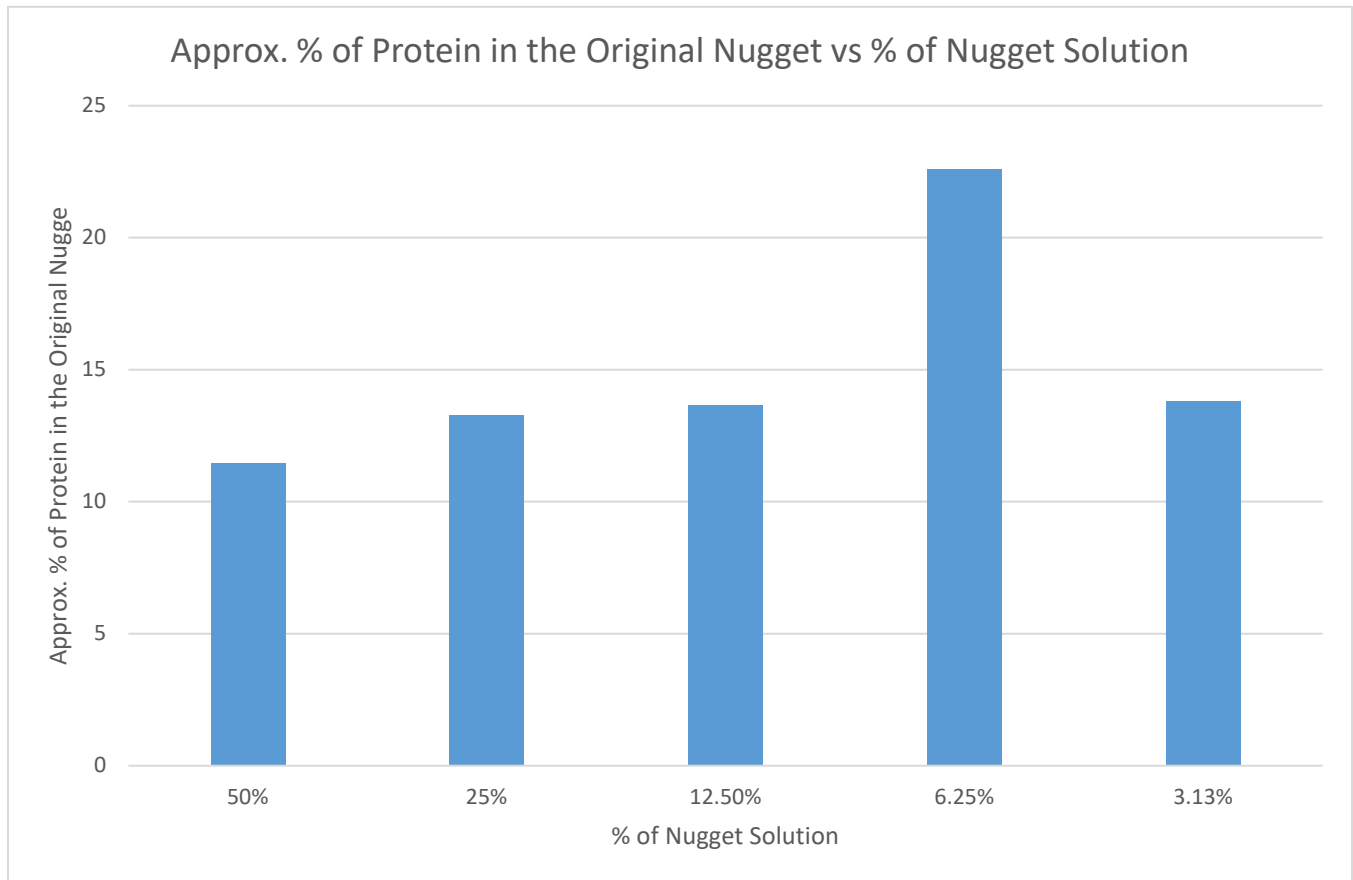
$$= \frac{\text{Protein Concentration of the Diluted Nugget Solution (c)}}{\text{Concentration of the Original Nugget Solution (a)}}$$
- Assuming all protein in the Chicken McNugget piece to be fully dissolved in the 100 g of water added,
 Mass of Protein per Piece of Nugget (e)

$$= \text{Equivalent Protein Concentration of the Original Nugget Solution (d)} \times 0.1$$
- Percentage of Protein in the Original Nugget (f)

$$= \text{Mass of Protein per Piece of Nugget} \div 11.18$$

 where 11.18 is the mass in g of a piece of Chicken McNugget with coating removed.

- The final result is as follow:



The Approx. % of Protein in the Original Nugget Solution shoots off for the 6.25% Nugget Solution Sample, this datum is therefore removed.

The average of the remaining 4 data is 13.0%, which is less than the 14.4% claimed by McDonald's HK (refer to appendix 1), but not by far.

On the other hand, according to the National Chicken Council, roasted whole chicken meat should contains 25 g of protein per 3-1/2 oz. (89.3 g) of portion size . This equates to 28.0% of protein.

Therefore, with 13% of protein in the McNugget used in the experiment, the maximum per cent of chicken meat within the McNugget can be calculated as

$$\frac{13.0\%}{28.0\%} = 46.4\%$$

This somewhat matches well with the 45% of chicken meat in McNugget claimed by McDonald's UK in 2016, assuming the remaining 55% of ingredient does not contain any protein.

Conclusion

In terms of the portion of protein in McNuggets, there is no significant difference among the percentage found in the scientific experiment, the percentage claimed by McDonald's UK in 2016 and the percentage currently (2019) listed in the official website of McDonald's HK. Hence, there is no evidence of McDonald's to have lied to the public.

Furthermore, the survey shows that there are 72% of people expecting the McNuggets to contain less than 50% of chicken meat. Meaning what McNuggets contain does live up to the expectation of the majority.

However, with 84% of people not knowing how McDonald's food is processed. As a food provider with around 240 shops in Hong Kong, selling mainly processed food, McDonald's should take a more dynamic role to let public to understand what processes are involved in preparing the food. At the same time, it should also alarm Consumer Council, Centre for Food Safety (CFS) and related government departments to plan for arousing the public awareness on what they put into their mouths.

Appendix

- Appendix 1
(https://www.mcdonalds.com.hk/content/dam/hongkong/English/food/food_quality/nutrition/nutrition_info/nutrition_info.pdf)

編者按：因涉及版權問題，原有插圖已被刪除。

• Appendix 2

中華基金中學中二級專題研習

考察題目：你在麥記吃到了什麼？

1. 請問你是屬於哪一個年齡組別？

- A 11 – 20
- B 21 – 30
- C 31 – 45
- D 46 – 60
- E 61+

2. 性別

- A 男 (26)
- B 女 (62)

3. 你是否經常惠顧麥當勞？

- A 經常 (兩週內四次以上)
- B 間中 (兩週內二至三次)
- C 較少 (兩週內少於兩次)
- D 從不

4. 你光顧 / 不光顧麥當勞的主要因素是：

- A 價錢
- B 食物質素
- C 推廣
- D 口碑
- E 便利
- F 餐廳環境

5. 你覺得麥當勞的食物質素如何？

不好 1 2 3 4 極好

6. 你覺得經常吃麥當勞食品會否影響健康？

不會 1 2 3 4 極會

主要因素是：

- A 烹煮方法
- B 鹽份糖份油份
- C 食材的新鮮程度
- D 衛生
- E 其他

7. 你主要惠顧的麥當勞食品是：

- A 牛肉漢堡包
- B 麥香雞
- C 魚柳包
- D 麥樂雞
- E 薯條
- F 早晨全餐
- G 沙拉
- H 其他

8. 麥當勞所提供的食物是否符合其宣傳的內容？

不符 1 2 3 4 極符合

9. 在麥當勞的宣傳中你覺得他們的食品是怎樣？

- A 新鮮
- B 美味
- C 含豐富營養
- D 不健康
- E 其他

10. 你估計漢堡扒(不計安格斯)內的牛肌肉的百分比是：

- A 0 - 25%
- B 25% - 50%
- C 50% - 75%
- D 75% - 100%

11. 你估計麥樂雞內的雞肌肉的百分比是：

- A 0 - 25%
- B 25% - 50%
- C 50% - 75%
- D 75% - 100%

12. 你是否了解從薯仔製作成麥當勞薯條的過程？

13. 你是否了解從蛋製作成早晨全餐中的炒蛋的過程？

14. 綜合來說，你是否了解麥當勞食品的製作過程？

是 否

謝謝

• Appendix 3

中華基金中學中二級專題研習

考察題目：你在麥記吃到了什麼？

1. 請問你是屬於哪一個年齡組別？

- A 11 – 20 (13)
- B 21 – 30 (28)
- C 31 – 45 (25)
- D 46 – 60 (19)
- E 61+ (3)

2. 性別

- A 男 (26)
- B 女 (62)

3. 你是否經常惠顧麥當勞？

- A 經常 (兩週內四次以上) (4)
- B 間中 (兩週內二至三次) (32)
- C 較少 (兩週內少於兩次) (49)
- D 從不 (3)

4. 你光顧 / 不光顧麥當勞的主要因素是：

- A 價錢 (17)
- B 食物質素 (14)
- C 推廣 (5)
- D 口碑 (2)
- E 便利 (56)
- F 餐廳環境 (3)

5. 你覺得麥當勞的食物質素如何？

不好 1 (5) 2 (20) 3 (58) 4 (5) 極好

6. 你覺得經常吃麥當勞食品會否影響健康？

不會 1 (2) 2 (3) 3 (27) 4 (56) 極會

主要因素是：

- A 烹煮方法 (16)
- B 鹽份糖份油份 (67)
- C 食材的新鮮程度 (10)
- D 衛生 (3)
- E 其他 (4)

7. 你主要惠顧的麥當勞食品是：

- A 牛肉漢堡包 (13)
- B 麥香雞 (7)
- C 魚柳包 (21)
- D 麥樂雞 (22)
- E 薯條(24)
- F 早晨全餐 (14)
- G 沙拉 (3)
- H 其他 (9)

8. 麥當勞所提供的食物是否符合其宣傳的內容？

不符 1 (6) 2 (26) 3 (40) 4 (16) 極符合

9. 在麥當勞的宣傳中你覺得他們的食品是怎樣？

- A 新鮮 (8)
- B 美味 (45)
- C 含豐富營養 (3)
- D 不健康 (26)
- E 其他 (2)

10. 你估計漢堡扒(不計安格斯)內的牛肌肉的百分比是：

- A 0 - 25% (16)
- B 25% - 50% (47)
- C 50% - 75% (24)
- D 75% - 100% (1)

11. 你估計麥樂雞內的雞肌肉的百分比是：

- A 0 - 25% (23)
- B 25% - 50% (40)
- C 50% - 75% (21)
- D 75% - 100% (3)

12. 你是否了解從薯仔製作成麥當勞薯條的過程？

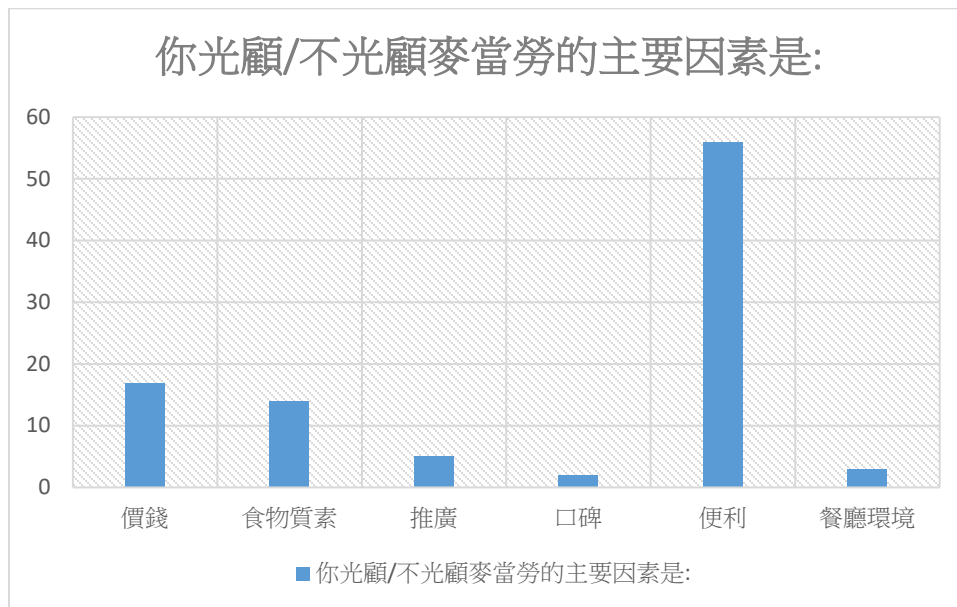
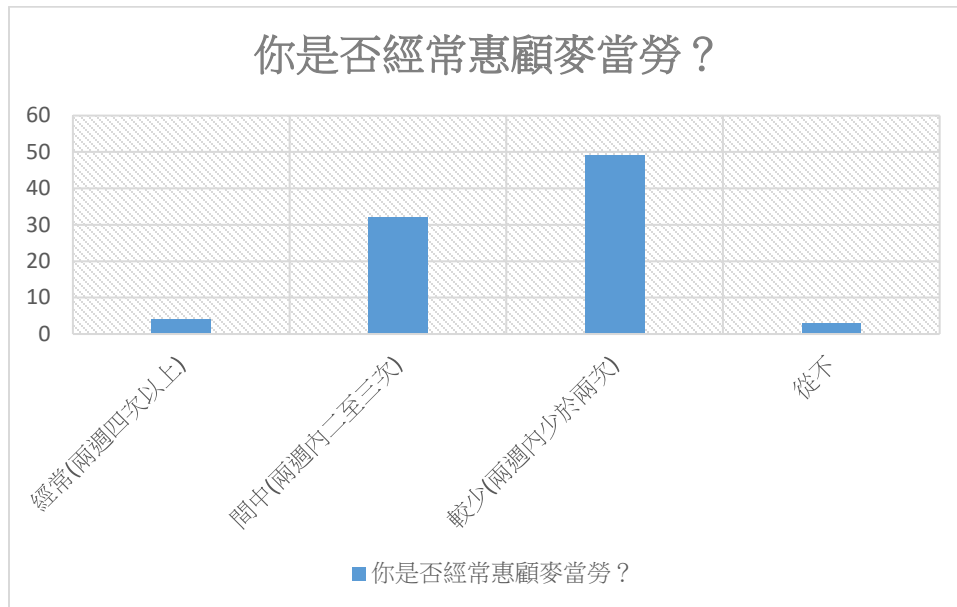
13. 你是否了解從蛋製作成早晨全餐中的炒蛋的過程？

14. 綜合來說，你是否了解麥當勞食品的製作過程？

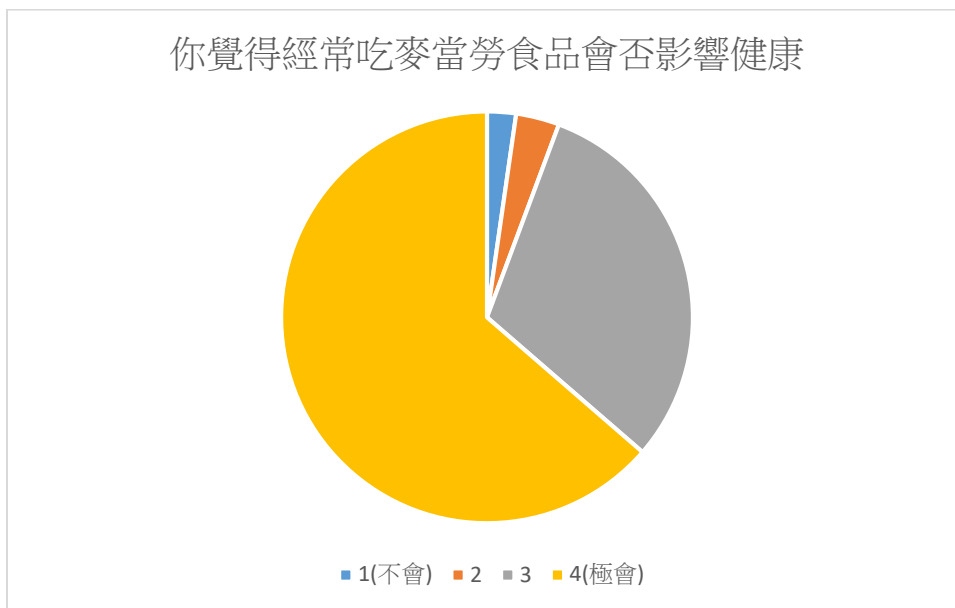
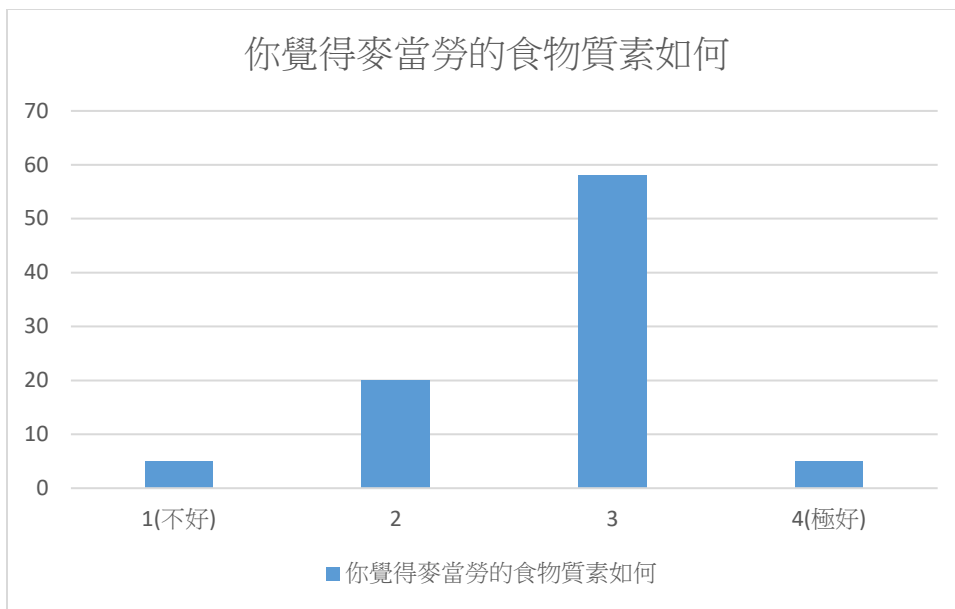
是 (74) 否 (14)

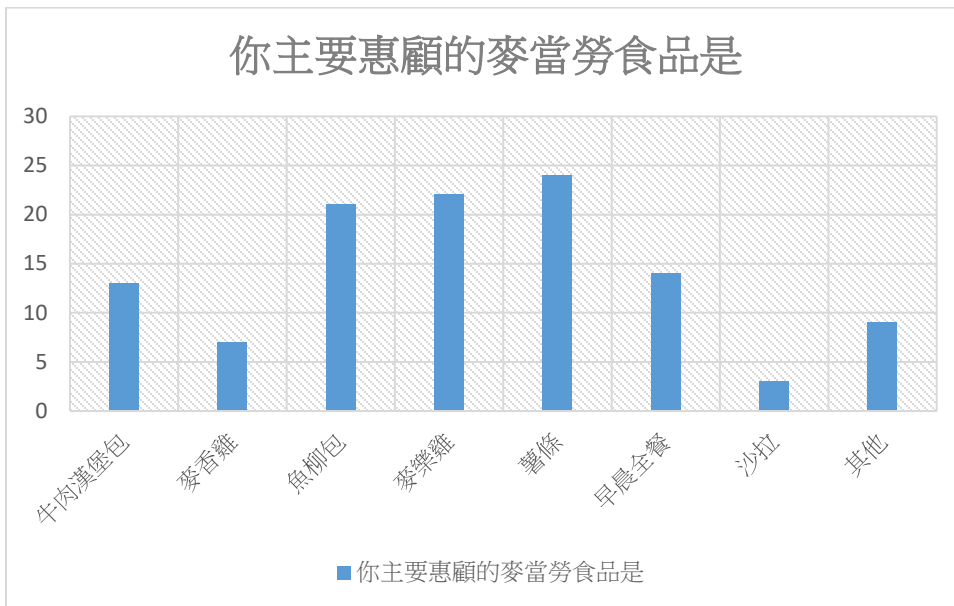
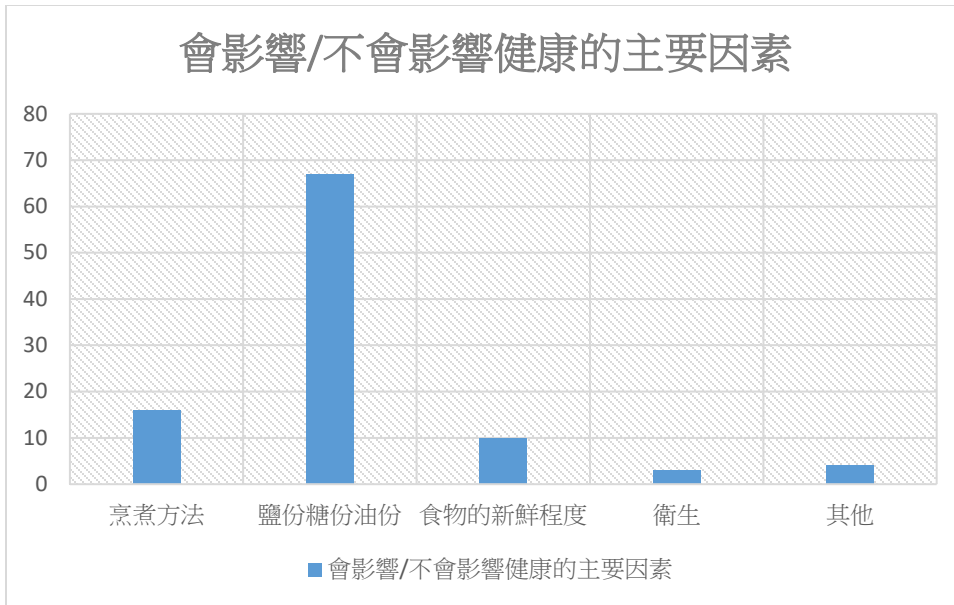
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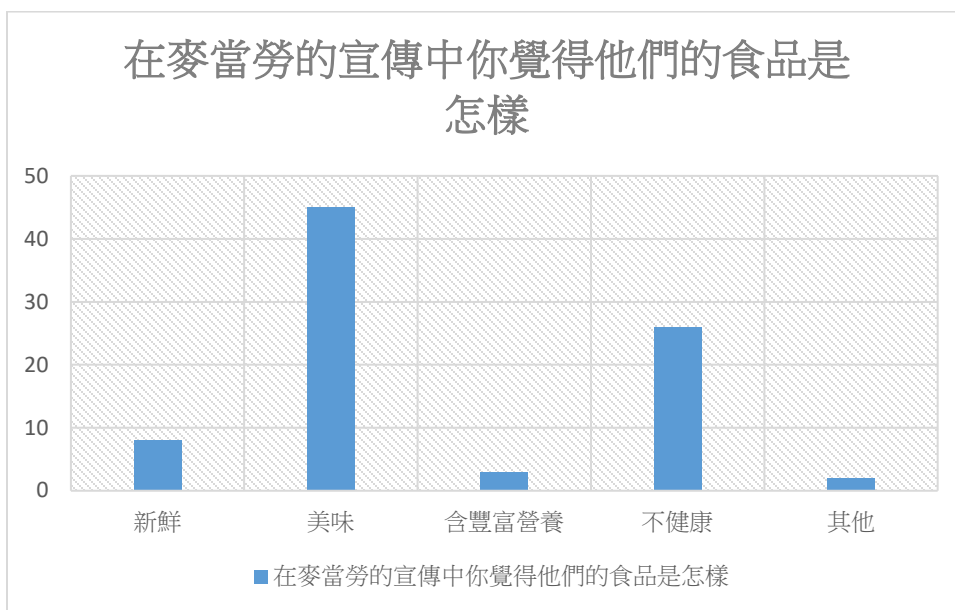
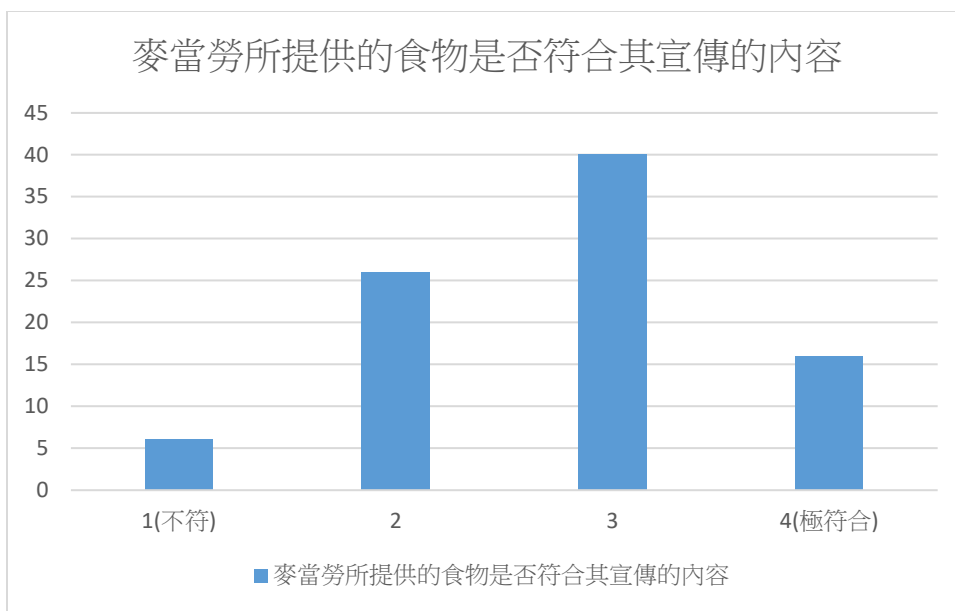
• Appendix 4

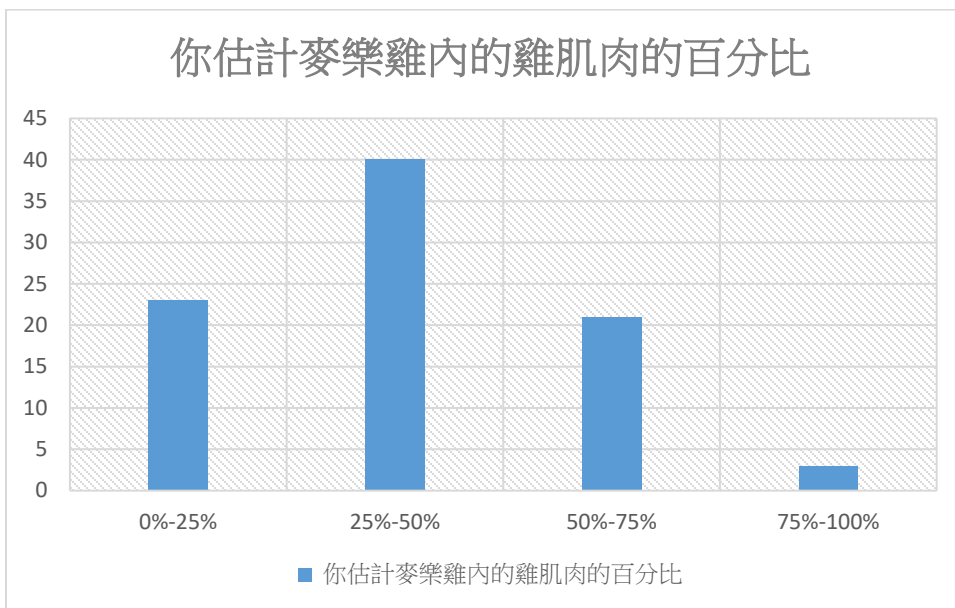
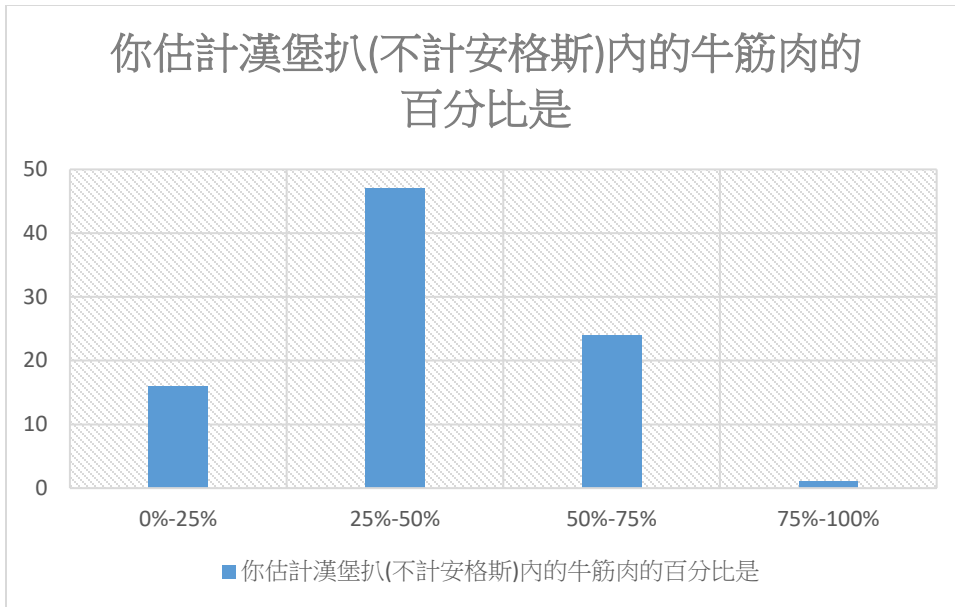


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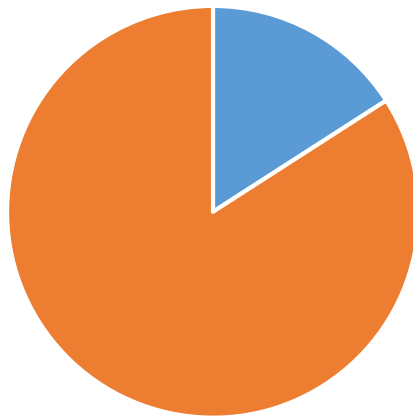








綜合來說你是否了解麥當勞食品的製作過程



■ YES ■ NO

- Appendix 5

According to the 2016 Population By-census done by the Census and Statistics Department, people in Siu Sai Wan (Tertiary Planning Unit 167) has a median age of 45.6, with 68.2% of people older than 5 being able to write English. On the other hand, people in Heng Fa Chuen (Tertiary Planning Unit 162) has a median age of 42.9, with 85.3% of people older than 5 being able to write English.

It can be concluded that Heng Fa Chuen composes of people with higher academic background, where as Siu Sai Wan with slightly more elderly.

Causeway Bay is also included in the survey as it is a business district, with people from different parts of Hong Kong.

Siu Sai Wan (Tertiary Planning Unit 167)

Sex		Male	Female	Overall
Median Age	Year	45.7	45.5	45.6

	Population Aged 5 and Over		
	Number of Persons		
Sex	Male	Female	Total
Whether Able to Write English			
Able to write	18 613	19 222	37 835
Not able to write	7 374	10 231	17 605
Total	25 987	29 453	55 440

(Tables from <https://www.byccensus2016.gov.hk/en/bc-dp-tpu.html>)

Heng Fa Chuen (Tertiary Planning Unit 162)

Sex		Male	Female	Overall
Median Age	Year	44.0	42.2	42.9

	Population Aged 5 and Over		
	Number of Persons		
Sex	Male	Female	Total
Whether Able to Write English			
Able to write	7 114	8 687	15 801
Not able to write	806	1 913	2 719
Total	7 920	10 600	18 520

(Tables from <https://www.byccensus2016.gov.hk/en/bc-dp-tpu.html>)

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