

Web Scraping Project



illumia®

Formula Milk
Price Comparative Analysis



6 HMOs*

Bioactive MOS**



Team Save Mas: Ingrid, Carol &
Lu

Aim

From our research, raising a child in Hong Kong is a huge cost to parents, especially in the baby-feeding stage.

Formula milk is **COSTLY** while
Price VARIES across chain stores & small online retailers.

We aim to provide formula milk price insight to mums to achieve money-saving purpose.

Avg. Cost of Raising A Child: **HK\$5.5M**

(from birth to college graduation)



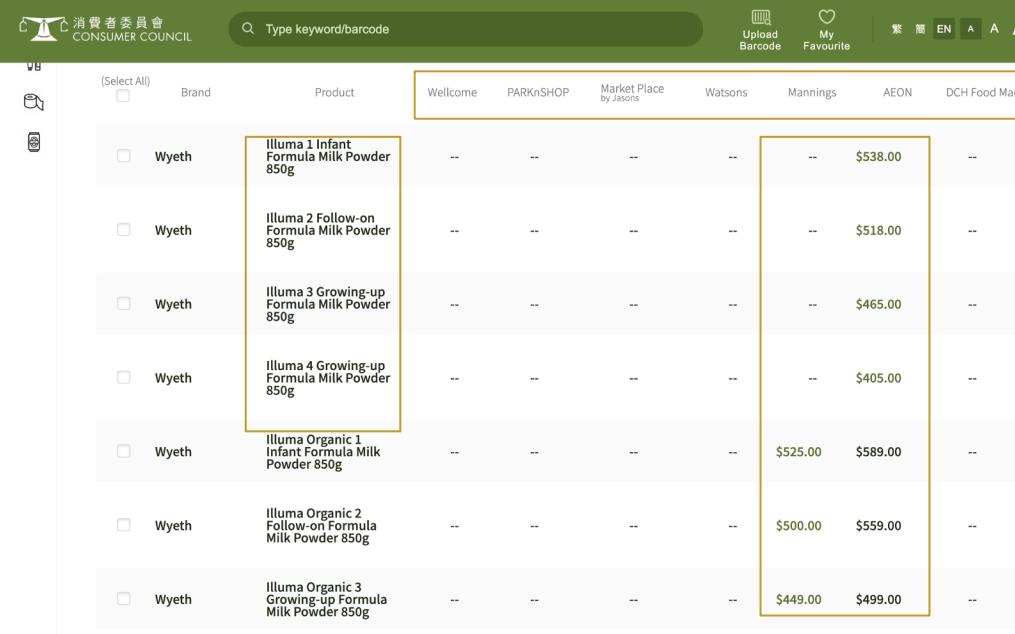
Avg. Cost of Feeding A Baby by Formula Milk:
HK\$12K in the 1st year

(Consuming 3-4 Cans per month)

Source: Hong Kong Bauhinia Foundation Research Centre & Department of Health

Opportunity

- FMCG product price comparison is available
- However, it only contains chain stores price data, and the data is limited



The screenshot shows a price comparison tool from the Consumer Council. The search bar contains "Type keyword/barcode". The interface includes buttons for "Upload Barcode", "My Favourite", and language selection ("EN", "繁", "簡"). The main table lists products by brand (Wyeth) and store (Wellcome, PARKnSHOP, Market Place by Jasons, Watsons, Mannings, AEON, DCH Food Mart). A yellow box highlights the Wyeth Illuma range.

| Category | Brand | Product | Wellcome | PARKnSHOP | Market Place by Jasons | Watsons | Mannings | AEON | DCH Food Mart |
|----------|--------------------------------|--|----------|-----------|------------------------|---------|----------|----------|---------------|
| | <input type="checkbox"/> Wyeth | Illuma 1 Infant Formula Milk Powder 850g | -- | -- | -- | -- | -- | \$538.00 | -- |
| | <input type="checkbox"/> Wyeth | Illuma 2 Follow-on Formula Milk Powder 850g | -- | -- | -- | -- | -- | \$518.00 | -- |
| | <input type="checkbox"/> Wyeth | Illuma 3 Growing-up Formula Milk Powder 850g | -- | -- | -- | -- | -- | \$465.00 | -- |
| | <input type="checkbox"/> Wyeth | Illuma 4 Growing-up Formula Milk Powder 850g | -- | -- | -- | -- | -- | \$405.00 | -- |
| | <input type="checkbox"/> Wyeth | Illuma Organic 1 Infant Formula Milk Powder 850g | -- | -- | -- | -- | \$525.00 | \$589.00 | -- |
| | <input type="checkbox"/> Wyeth | Illuma Organic 2 Follow-on Formula Milk Powder 850g | -- | -- | -- | -- | \$500.00 | \$559.00 | -- |
| | <input type="checkbox"/> Wyeth | Illuma Organic 3 Growing-up Formula Milk Powder 850g | -- | -- | -- | -- | \$449.00 | \$499.00 | -- |

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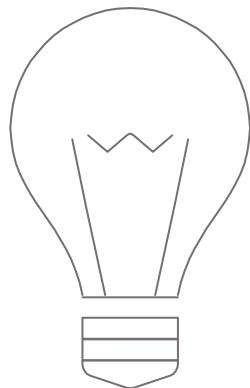
Project Business Value:

Advising mothers with newborn babies to purchase formula-milk with the best prices, and also saving time on price comparison across eCommerce platforms.



Happy Mum Happy Life

What we will do...



Choosing a formula-milk brand and consolidate its product data from range of online stores

Analyse and compare price range between chain stores and small retailers for customers' decision making

Money-saving insight on purchasing formula milk in the whole baby-feeding stage

About illumia

- One of the best-selling formula-milk brand in Hong Kong
- Provide **4 stages** of babies' formula-milk from newborns to 3 years-old and above
- 4 Collections Including:
LUXA, Organic, Human Affinity(HA) & Atwo
- Its price range is more variable in the market, compared to other brands



Data Collection + Cleaning



Collecting & Cleaning Data

Google Shopping



HTML (using BeautifulSoup)

Scraping from the shopping result of the powerful Google Search Engine , which **already consolidated** key merchants' product data, as well as individual online retailers.

親和人體®有機配方



Illuma Organic Stage 1
Infant Formula 850gilluma

HK\$525.00
Watsons Hong Kong
HK\$0.00 delivery

Web Scraping

Data Cleaning



e-Commerce
Store

Covering one of the largest chain stores which is not in Google Shopping search result.

HTML (using BeautifulSoup)

1. Cleaning up data information and split into product series, volume , stage and unit price.
2. Merge with Mannings and Sogo data

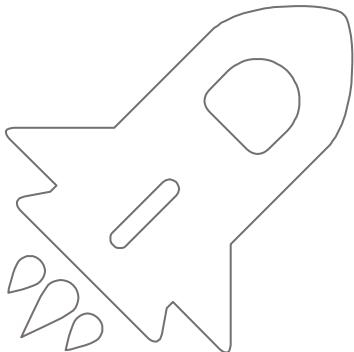
Java Script (using Selenium)

Final Dataframe

Merge and extract data into the following fields.

| | Title | Price | Merchant | Series | Can | Stage | Parallel Import | Unit Price | Merchant Type |
|---|--|--------|-------------------|---------|-----|-------|-----------------|------------|---------------|
| 0 | [新版]惠氏illuma 啟賦 1段 0-6個月 850g(new packing) 4階段 | 285.0 | Thai Ho Pai | Luxa | 1 | 1 | not stated | 285.0 | Others |
| 1 | 惠氏illuma 啟賦 4段 3歲以上 850g. | 305.0 | Thai Ho Pai | Luxa | 1 | 4 | not stated | 305.0 | Others |
| 2 | illuma luxa hmo 1號初生嬰兒配方奶粉 (6種hmo) 850克買滿\$399免運費 | 432.0 | Watsons Hong Kong | Luxa | 1 | 1 | False | 432.0 | Chain |
| 3 | 原裝行貨-惠氏港版illuma luxa 3號 兒童成長配方奶粉 850g (6罐裝) | 1770.0 | Parpee Shop | Luxa | 6 | 3 | not stated | 295.0 | Others |
| 4 | illuma hmo初生嬰兒配方奶粉1 | 538.0 | aeoncity.com.hk | Luxa | 1 | 1 | False | 538.0 | Chain |
| 5 | 惠氏illuma 啓賦 2段 6-12個月 850g. | 335.0 | Thai Ho Pai | Luxa | 1 | 2 | not stated | 335.0 | Others |
| 6 | illuma-(2021 新包裝) 惠氏 illuma luxa 啓賦 850g #2號 x 1罐 [香港行貨] (2021 新包 ... | 370.0 | HKTVMall | Luxa | 1 | 2 | False | 370.0 | Others |
| 7 | illuma 有機 嬰兒配方奶粉 900克(0-6個月) 1階段 | 465.0 | Thai Ho Pai | Organic | 1 | 1 | not stated | 465.0 | Others |
| 8 | illuma 有機幼兒成長配方奶粉 850克買滿\$399免運費 | 439.0 | PARKnSHOP.com | Organic | 1 | 1 | False | 439.0 | Chain |
| 9 | illuma 配方奶粉 - 1號 | 425.0 | Mamy Kingdom | Luxa | 1 | 1 | not stated | 425.0 | Others |

Challenges



ILLUMA - LUXA Stage 2 Follow-On Formula Milk Powder
Baby Care/ Food

Price \$ 215.00 200+ Sold

Exchange Price Offer [PC Redemption Offer](#)
Buy any selected items Items at \$39 / \$49 / \$55
[Proceed to Shop >](#)

Packing Spec 350g
Country of Origin Germany
Description LUXA Stage 2 Follow
Delivery / Return • * The product can soonest when the c

Case 1: Volume is not provided in title

- Google shopping search result is **dynamic**
 - Need to **check if loaded results are desirable** before proceed to next step
- **Data cleaning** is the biggest challenge
 - **Product titles** are not aligned among different merchants
 - Yet, need to **extract product series, volume and stage no.** from product titles
 - Title details provided by suppliers may be inaccurate

惠氏-illumula啟賦 4號 兒童成長配方奶粉 850g (平行進口) illumula啟賦 4號 兒童成長配方奶粉 850g (平行進口)

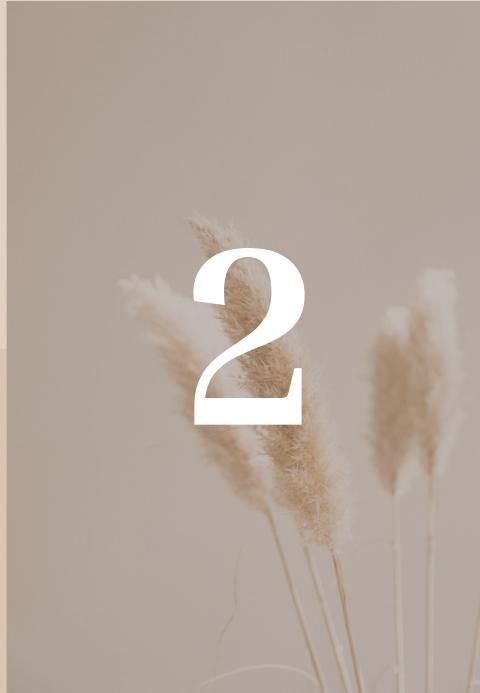
illumula 配方奶粉 - 1號

wyeth 惠氏 - illumula啟賦 2號 較大嬰兒配方奶粉 850g - lifestyle | nursing-feeding ...

Case 2: Various data structure of product titles

Data Visualization With Insight

2



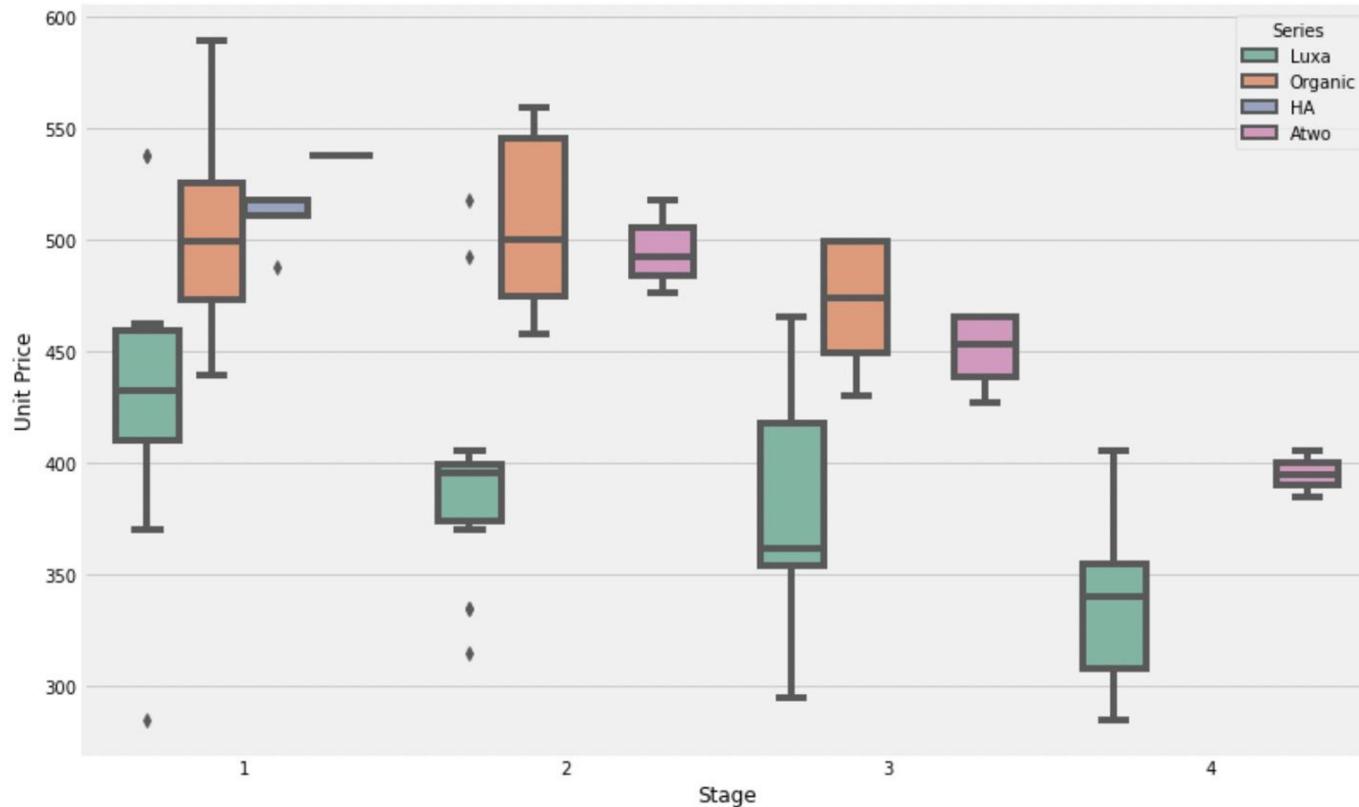
Price Overview

| Stage | Avg. | Max | Min | Difference |
|-------|--------|-------|-------|------------|
| 1 | 481.47 | 589.0 | 305.0 | 284.0 |
| 2 | 431.37 | 559.0 | 315.0 | 244.0 |
| 3 | 422.73 | 499.0 | 295.0 | 204.0 |
| 4 | 347.29 | 405.0 | 295.0 | 110.0 |

| Series | Avg. | Max | Min | Difference |
|----------------|--------|-------|--------|------------|
| Luxa | 385.75 | 538.0 | 305.0 | 233.0 |
| Organic | 499.31 | 589.0 | 429.9 | 159.1 |
| ATwo | 483.19 | 538.0 | 384.75 | 153.25 |
| Human Affinity | 510.50 | 518.0 | 488.0 | 30.0 |

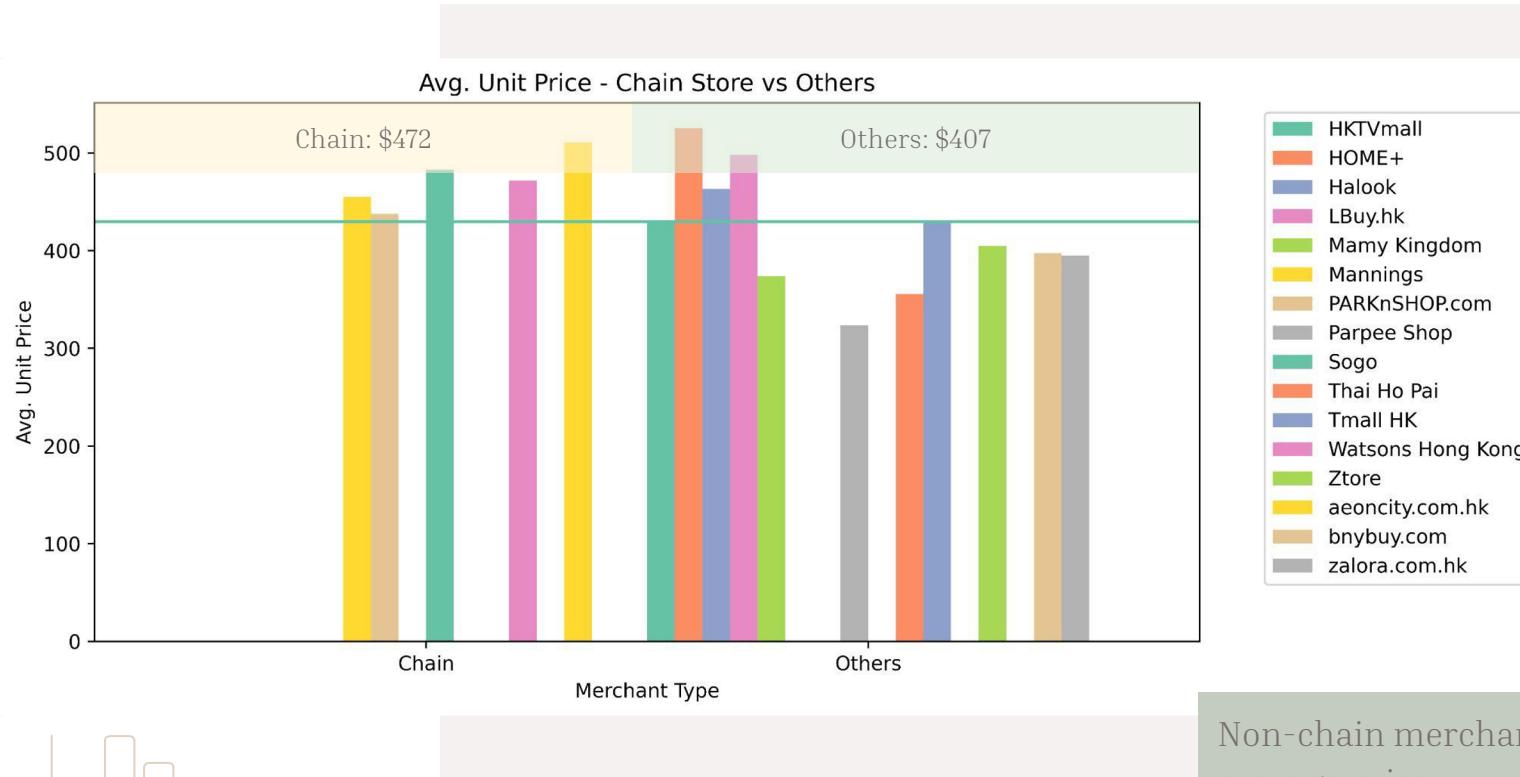
- Price range of each stage and series would be huge, which has **HK\$200-300 price difference** per can of formula milk.

Price ranges of illumia Formula-Milk



- Price reduced correspondingly with from stage 1 to 4.
- Luxa collection's price range is lower than other series.
- Stage 1 's price range is more various, from around \$200-\$500 above.
- HA and Atwo's collection has less variety on price.

Chain Stores VS Small Retailers



Non-chain merchants has a lower average price

Best place to purchase for 4 stages

| Series | Stage 1 | Stage 2 | Stage 3 | Stage 4 |
|----------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------|
| Luxa | HKTVMall HK\$410 | TMall HK HK\$315 | Mamy Kingdom HK\$345 | Thai Ho Pai HK\$305 |
| Luxa (Bulk) | Parpee Shop HK\$370 | / | Parpee Shop HK\$295 | Parpee Shop HK\$295 |
| Organic | PARKnSHOP.co m HK\$439 | Thai Ho Pai HK\$458 | Halook HK\$429.9 | / |
| ATwo | Watsons* HK\$538 | PARKnSHOP.co m HK\$476 | PARKnSHOP.co m HK\$427 | Mannings HK\$405 |
| ATwo (Bulk) | / | / | / | Sogo HK\$384.75 |
| Human Affinity | HKTVMall HK\$488 | / | / | / |

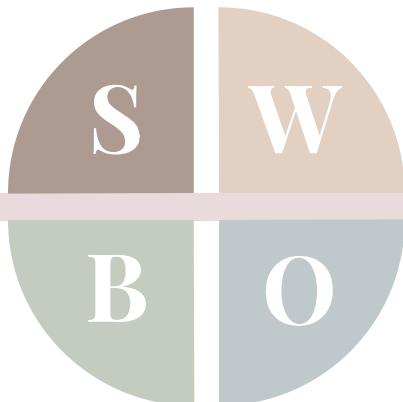
Conclusion

STRENGTHS

Easy to apply for customers on price comparison

WEAKNESSES

Lacked of daily price updates
Inaccurate data provide by suppliers



To stakeholder:

Competitive analysis for setting price strategy

Increase quantities of online stores covered

To customers:

MONEY SAVING!

Daily scraping to get the most updated price

BENEFITS

Drill down into marketplace suppliers for more information (delivery, promotions, etc.)

FURTHER OPTIMIZATION