

Vertical Farming & Flowers, Kuwait

2022 _____

Introduction

New businesses take risks when introducing new brand and/or entering a new market. Taking calculated risks is vital. That's where market research comes into the picture. Launching a brand or entering a new market requires high capital investment & accepting the risks that comes with it. However, just that won't be enough to make the brand successful & achieve sustained growth & profitability.

Despite having the required investment, new businesses lack the competitive insight of the market, competitors and consumers. Hence, they disappear from the market after just a few months. **Without a good understanding of the industry, businesses can make the wrong strategic decisions** such as investing in the wrong market at the wrong time, thus leaving no room for the new brand to survive and thrive. Some would also make increased investments in product acquisition and marketing without clear strategies and business goals. **When it comes to market research, a common mistake that failed businesses end up making is they rely on gut feeling and/or outdated market research that does not count for the changing consumer behaviour in the current times.** As a result, the strategic decisions are mixed with cognitive bias and misguided theories, avoiding the factual information on key market trends and behaviour, leading to bad business decisions.

Poixel's market research collects an extensive list of consumer data such as their buying habits, market size, purchasing cycle, and top competitors. Our market research reports cover critical aspects of the market to help businesses identify market gaps, equip them with the vital insights and knowledge to develop a strong brand and loyal consumer base.

Readers may benefit from the report by utilizing the provided research analytics with the goal to improve business performance and capture new opportunities. Re-evaluate your business models to make changes as necessary. Analyze competitors' strategies and decision-making processes to understand potential problems your product can fulfill. Study consumer behavior and market dynamics to learn developing market trends within your industry.

At Poixel, our primary goal is to build authentic and credible data to support business strategies and develop new market opportunities. Our market research process begins by auditing the business and defining the research goals. Then, we conduct a secondary research, which includes collecting data from credible data sources, receiving inputs from the industry, and auditing competitor's strategies related to social media, online-selling, offline-selling, and offered product lines. Next, we proceed with the primary research, which involves market sampling, conducting in-field surveys, interviews, and online surveys to a random sample of the population and industry competitors. After which, we analyze the results and present our findings. With the market research process, Poixel aims to build credible market data that companies can rely on when making strategic decisions.

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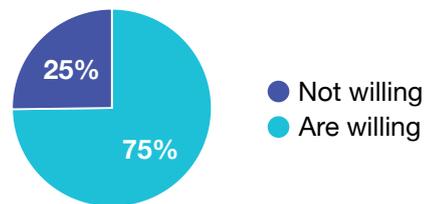
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Research Methodology

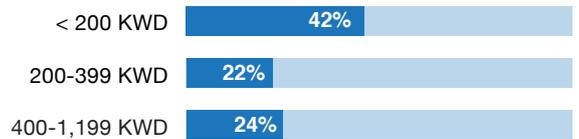
About the Respondents

Poixel collected a random sample of 2284 individuals in Kuwait. Out of our sample, 24% were males, and 76% were females. 35% were between 20-24 years old, and 60% were single. Furthermore, out of 40% of the sample, 84% have children. Moreover, 22% are earning 200-400 KWD. Poixel interviewed the purchasing department in supermarkets, hotels, and restaurants to understand the purchasing decisions and supplier relations. Those interviewed included City Center, Lulu Hypermarket, Grand Hyper, Al Hamra Hotel, Grand Majestic Hotel, Calorie Control, Maki, Mughal Mahal, and Al Jawda. Furthermore, Poixel interviewed the management at co-operative societies within Abu halifa, Abu Fintas and Abu Ftera. For the flower market, Poixel developed a unique survey and interview sessions with established flower stores to understand their business model and impact of COVID-19.

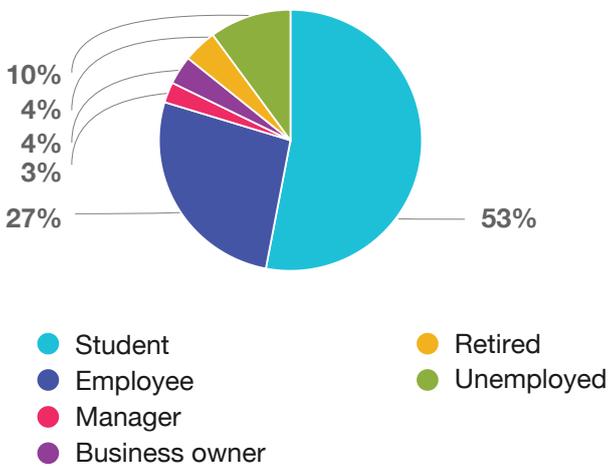
Willingness to pay more for healthy, organic and pesticide-free produce



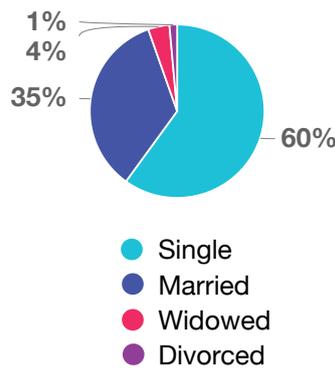
Monthly Income



Employment Status

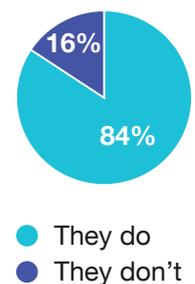


Marital Status

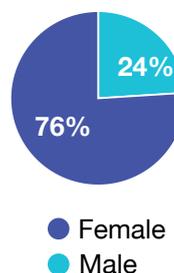


Having children

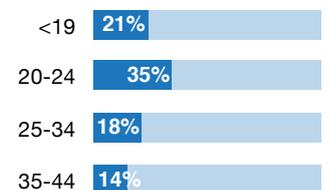
40% of the total sample



Gender



Age bracket



Executive Summary

Kuwait's farming industry has not adapted to the changing times; nor has it adopted a forward-looking approach to its citizens

The goal of our study was to identify the key trends in the fresh produce market, as well as the needs and behaviors of businesses and farmers. In addition, we wanted to understand the demand and interest in vertical farming in the region. By efficiently utilizing resources, vertical agriculture is a sustainable way of producing fresh vegetables. The industry needs to adapt a sustainable approach, since neighboring countries such as the UAE and Saudi Arabia are already way ahead of the game

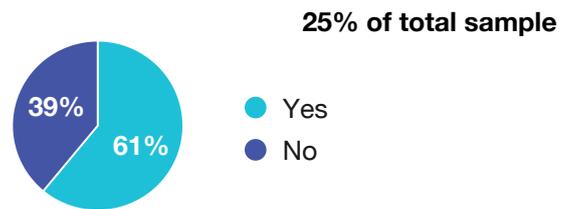
Kuwait relies heavily on imported food for a variety of reasons, including its weak agriculture industry, which traditionally produces fruits and vegetables such as tomatoes, onions, and melons. The agricultural sector contributes less than 0.5% to the country's GDP. With an average rainfall of 4.5 inches, 0.6% of arable land (10,600 hectares), and future expansions in construction of cities and real estate developments, further agricultural development seems unlikely. A poorly developed agriculture sector would pose a major threat to most countries. By contrast, Kuwait's small population, greater country wealth, and diversified food supply chain allow it to avoid such risks.

Government support is essential to make a shift in the industry. Farmers must express interest in and be educated about sustainable production methods such as hydroponics, aeroponics, aquaponics, and greenhouses. A few farmers in the country use hydroponics as a farming method. However, the majority of farmers showed low initiative towards investing in a sustainable farm due to its expenses and low ROI.

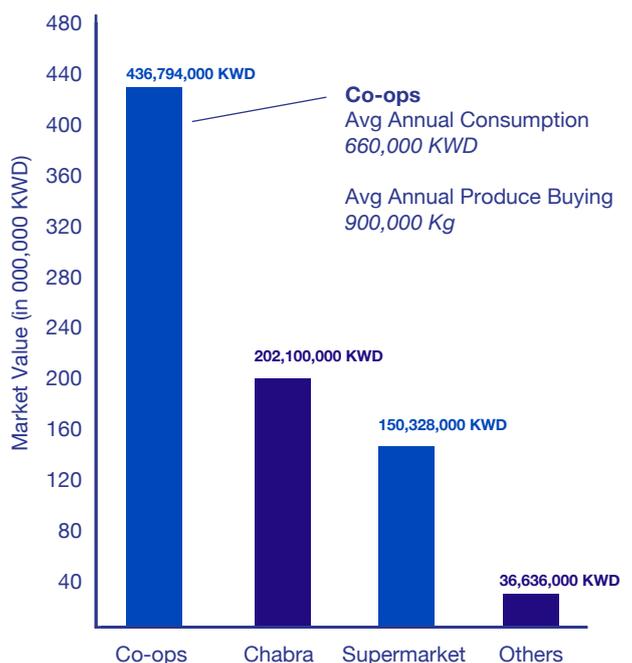
Do you prefer local produce or imported?



Do you look for herbs that were planted in vertical farms?



Market Value of Fruits and Vegetable Industry of Kuwait, 2022



Glossary

Fresh produce: Consists of fresh fruits and vegetables

Local auctions: Local auctions in Kuwait are held at Kuwait Farmer's Union and the farmer's market (popularly known as "Chabra" locally)

Traditional farming: Traditional farming consists of the conventional farming approach of growing produce through the use of regular agricultural land

Vertical farming: Vertical farming involves growing fresh produce in a vertical infrastructure whereby the resources such as land, water and growing materials are used efficiently to maximize yields

ROI: Return-on-investment is a way to judge how well one investment has performed in comparison with others

Competitive pricing: When competitors compete based upon the lowest prices, this is called competitive pricing. In it, the only basis of competition is whose price is the lowest

Mid-range consumers: These individuals are earning upwards of 500 KWD monthly and have a suitable income stream to classify them in the mid-range class

AgTech: Agricultural technology focused on improving the farming industry through the adoption of data, IoT systems and infrastructure to make farming sustainable and efficient in producing yield

Porter's 5 Forces Analysis: Porter's 5 forces are a framework for analyzing a company's competitive environment. Competitors, new entrants to the market, suppliers, customers, and substitute products, all of which affect a company's profitability, are included in this study

SWOT Analysis: SWOT analysis is a popular tool for examining the strengths and weaknesses of a brand and examining the market opportunities and threats. Among many methods, Poixel conducted SWOT analysis based upon a 5-Factor Rating Scale to give accurate results for comparison

Market saturation: A market no longer shows new demand for a firm's products due to competition or because the company's products are less popular

Food security: Ensures that food is always available, accessible, and affordable for all citizens of the country

Industry Outlook

| Industry Elements | Vertical Farming |
|---|--|
| Industry Type | Business-2-Consumer (B2C) Business-2-Business (B2B) |
| Industry Sectors¹ | Restaurants, Supermarkets, Hotels, Airlines End customers |
| Market Value² | 860,000,000 KWD 1,460,000 tons annual consumption |
| Number of potential buyers³ | 1,627,600 Potential Buyers 11 KWD Avg Checkout Value ⁴ Per Consumer |
| Key Competitors | &ever (Vertical Farm) Local farms and Suppliers (Normal Produce) |
| Vertical Farming Methods | Hydroponics, Aeroponics, Aquaponics |
| Vertical Farming Structure | Building-based farm Container-based |
| Vertical Farming Crops | Microgreens and baby versions of tomatoes, potatoes, lettuce, kale, spinach, strawberries |
| Vertical Farming Components | Lighting, Climate control, Sensors, Insulation, HVAC System |

¹ The industry sectors relevant for vertical farms

² Market value is the estimated revenue generating capacity of the vertical farm industry

³ Number of estimated buyers for organic, local, and vertically grown produce

⁴ Average checkout value here refers the average expenditure of fruits and vegetables on a weekly basis per customer

Key Findings

Farming Supply Chain Analysis

- Farmers cannot sell their local produce directly to coops. They sell them through auctions through the farmers' association and Chabra where the coops participate
- Some issues that face farmers: unfair auctions, water & electricity supply getting cut off at random times, harsh weather conditions and the damage to the crops as a result to it
- The government has allocated 7 million KD for the support of farmers however some farmers have yet to receive such support
- Companies and intermediaries have resulted in importing fresh produce to be able to directly sell and profit from the coops
- Most farmers are aware of vertical farming and they know what it is, however they are discouraged to pursue it because it is expensive and they feel that the ROI will not be enough
- Farmers view the restaurants and hospitality industry as not profitable due to their low volume of orders per day
- Farmers are a little reluctant to pass their farms to outside management due to the cost and their desire to keep their business to themselves to avoid commitment with outside parties

Consumer Behavior towards Fresh Produce

- 35.57% of respondents did not adhere strictly to changing their lifestyle, while 64.43 percent had adopted a healthy lifestyle

- 60% of people who cook always tend to buy vegetables and fruits more than 35% of those who have someone to cook for them
- A long shelf life and attractive packaging are not among the most important criteria when buying fresh produce for people who cook a lot
- The more family members, the greater feeling of responsibility to fulfill their needs by buying good produce
- 74.16% of participants are willing to pay more for organic items and pesticide-free foods
- 27% of the whole sample actively look for herbs made from vertical farms
- 51% of consumers shop from a cooperative society instead of supermarkets or small stores

Consumer Behavior towards Flowers

- 72% of the sample buys flowers for special occasions only, while 25% buy on a monthly basis
- 75% prefer to buy flowers in-person in the shop rather than purchasing online through apps and website
- 31% buy flowers to keep their houses and gardens decorated at all times
- 24% of the sample plants flowers themselves in their gardens, while the rest don't
- Roses, orchids, lavender, and lilies are the top purchased flowers. Type of flower matters relatively less compared to the color and fragrance of the flower

B2C Fresh Produce Analysis

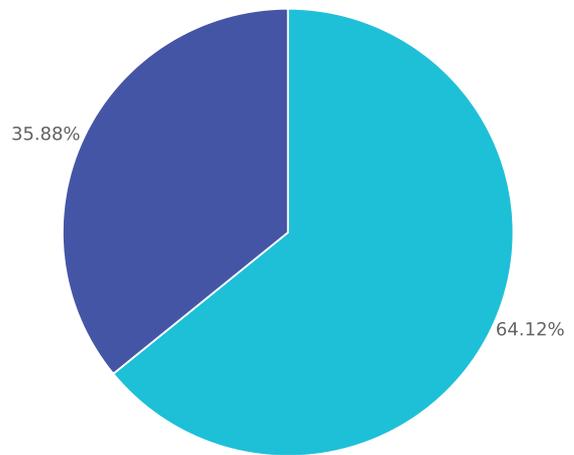
Healthy lifestyle

The recent COVID-19 pandemic has fostered households to take care of their wellness, and they were asked by health authorities to take safety measures to end this pandemic. Therefore, the survey results showed that 64% of participants have adopted a healthy lifestyle, while 35% did not adhere restrictively to changing their lifestyle. Poixel finds 7 out of 10 males adopted a healthier lifestyle, which is slightly more compared to women. Furthermore, those who cook their food showed an increased motivation to stay healthy.

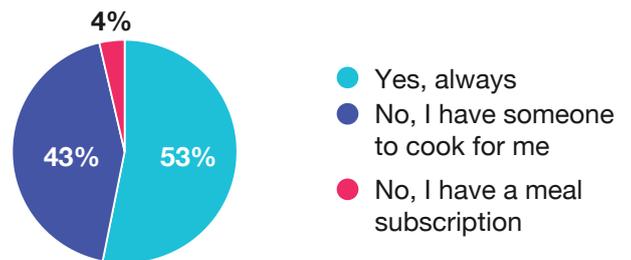
Cooking habits

According to the survey results, the most significant finding was the positive correlation of diet, vegetables & fruits, and the frequency of purchases. The survey indicates that 60% of people who cook always tend to buy vegetables and fruits more than 35% of those who have someone to cook for them. However, other consumers find it irrelevant to their choices of vegetables and fruits because of the presence of meal subscriptions. We noticed a greater interest in cooking increases the number of visits to Co-ops to buy vegetables and fruits. This inference matches with both who is cooking or who has someone to cook for them because it acts as an incentive to buy fresh products. The first criteria for purchasing fresh produce is the best price, followed by cleanliness and taste. Life span and attractive packaging were of the least importance to the ones who cook constantly. **The reason being, they regularly order fresh items and hence focus less on packaging and more on quality and pricing.** However, factors that were of equal importance were the locality of products, organic items, and the use of fewer chemicals and pesticides.

Adopted a healthier lifestyle since COVID-19



Do you cook your own food?



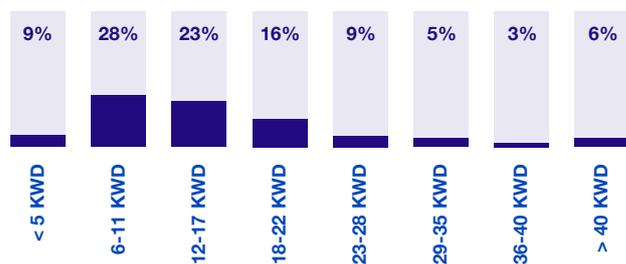
Local Vs. Imported

When asked about their preferred produce, 56% of respondents expressed that they prefer local produce and buy it whenever it is available. 18% of respondents listed that locally made produce is within their top three factors when choosing produce while they are shopping. This shows the importance of the presence of local produce in the market and how important supporting local farms is to the consumers.

Family responsibilities

Family responsibilities, such as caring for loved ones within a household, have a significant influence on the purchasing and preference for organics. Following an analysis of Poixel’s data, 86% of families with children consume more vegetables and fruits and find themselves responsible for buying good produce. The more family members, the greater feeling of responsibility to fulfill their needs. To ensure the wellbeing of the household, they choose the final product based primarily on taste, cleanliness, and price. Long life span, pre-cut fresh products, and attractive packages are of least importance to them. Further, we have noticed that the ones with few family responsibilities tend to give slightly higher preference towards taste and cleanliness of produce compared to the ones with most family responsibilities

Weekly Expenditure on fruits and vegetables while shopping for groceries

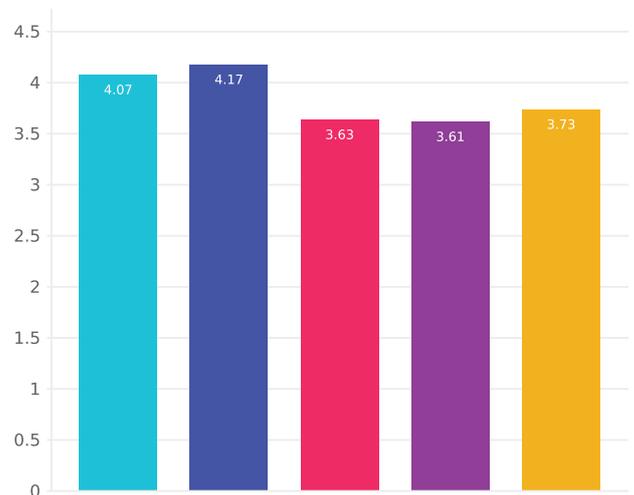


There are two common interests that family members, regardless of the presence of children, share in buying organic items. 74.16% of participants surveyed expressed their willingness to pay more for organic items and pesticide-free food. It is a good indication that community awareness is high and such products are being supplied by local supermarkets. Moreover, our study shows a relatively positive symmetrical distribution that indicates the frequency of purchases caring for the household. They spend at the grocery store at a minimum range of 6 KWD to 18 KWD per week; A weekly average of 12 KWD. It is less probable to spend in the highest range of 36 KWD to 40 KWD; a weekly average of 38 KWD. Fewer results show that consumers will buy less than 5 KWD or higher than 40 KWD per week and that is due to the availability of the products in various stores and assurance of freshness of fruit and vegetables.

Awareness (farming and environment)

The importance of environmental awareness resides next to educating the consumers towards their daily life behavior and consumption. Many issues have recently befallen negatively on natural habitats, such as food waste, increased emission from the food industry, and drought. Few businesses in Kuwait work towards achieving corporate social responsibility, and it includes accountable actions to achieve sustainable food production, and environment preservation.

How do you feel about the following statements?



- I actively care for sustainability measures
- I value fair and equitable treatment of farmers and food workers
- I believe my individual choices have an impact on the environment
- I am educated about the environmental impact of my individual choices
- I am well educated about healthy eating options

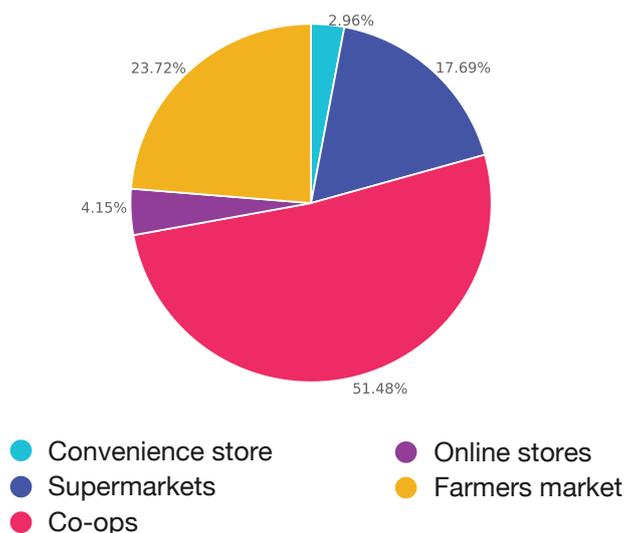
Poixel’s survey included attitude measures to understand consumer behavior and their choices that have an impact on the environment interchangeably. On a scale from 1 to 5, the survey participant was asked to express their sentiments about five statements. First, 49.50% of the total sample strongly agree to care about taking sustainable measures, an average of 4.06 for this range. Second, 52.35% value fair and equitable treatment towards farmers and food workers, which has an average rating of 4.15. Third, people are indifferent to the impact of their individual choices on the environment or the environmental impact on their choices. 33.89% strongly agree that their individual choices have an impact on the environment. However, 33.26% are neutral towards being conscious of the environmental impact of their decisions. Both statements shared an average scale of 3.61 out of five. It is favorable that workshops and attractive media materials increase the likelihood of understanding diet carbon footprint and how it is affecting climate change. Last, 34.52% tend to be educated about healthy eating options, while 28.82% are neutral towards the same. The average scale for this statement is 3.17 out of five. The younger generation is also starting to be vocal about their belief of fair trade and that farmers are treated fairly. People in Kuwait have heard about struggles that farmers face in the industry and have voiced their support for farmers, especially the younger generation.

Regarding the knowledge of agriculture and farming, only 27% of the whole sample look for herbs made from vertical farms. The average deviation states that 22% is certainly true whether the answer is yes or no. On the contrary, 5% were uncertain when they had stated their answers. As a result, we infer the need to educate the target audience regarding the benefits of these products on one’s health and support the society towards energy saving. People feel loyal to purchasing a local product as 55.69% claim to support the local farmer’s production. However, 12.86% prefer to buy imported produce, and 31.45% buy whichever is available.

Purchasing Habits

Poixel's survey finds that 51% of consumers shop from a cooperative society instead of supermarkets or small stores. Upon further analysis, we find the majority of married couples prefer to shop from farmer’s market and co-operatives (57% prefer co-operatives and 25% prefer farmer’s market). The same holds true for single individuals, where 23% prefer to shop from farmer’s markets and 46% from co-operatives. Purchasing power represents the ability of consumers to pay for goods and services. Poixel’s research finds that 25% are willing to pay more for organic produce when shopping at farmer’s market.

Preferred places to buy fruits and vegetables from



Moreover, respondents are mostly within the income range from less than 200 KWD up to 900 KWD. They find substitutes for less expensive products and prefer to follow healthier choices. However, the lower income segment prefer to buy from a local convenience store (baqala), while online channels receive the lowest preference of them all. In addition, the higher the income, the less likely they are to buy from a local convenience store (baqala), and the farmer’s markets (chabra). Furthermore, the frequency of buying from all stores is once every week or every two weeks.

Business Analysis

Demand for organic produce

Supermarkets, which sell imported and local produce, are willing to work with local farmers to buy locally-made products. Supermarkets such as Sultan Center, Lulu, and City Center have a regular supply of vertical farm produce from Kalera. Apart from Kalera's produce being the first of its kind in the market, supermarkets decided to retail their items due to the competitive pricing, product quality, and professional packaging. Hardly any retailer sells produce because it is "organic." The main goal for retailers is to have multiple product options that cater to mid-end and high-end consumers. These products should be of great quality and safely grown. Regarding restaurants and hotels, they are willing to work with organic and locally made produce, provided the price is right, and there's acceptable demand for it.

“We started working with &ever (now Kalera) from the beginning when it was launched in Kuwait. The reason was because it was the first vertical farm in Kuwait with excellent product quality and professional packaging”

Rishad Lateef, Central Buyer for Fruits and Vegetables at Lulu Hypermarket

Supplier criteria

Regarding restaurants and hotels, **Poixel finds that procurement managers mainly focus on three things when working with suppliers: product quality, consistent supply, and competitive pricing.** Restaurants and hotels that target mid-range consumers have not worked with local farms in the past due to their inability to supply consistently daily. However, they are willing to work with local farms and introduce organic produce in their meals, given that farms are able to supply the products at a price similar to their current cost and supply them consistently (ranging from 750-1000KG orders of one type of produce monthly for one restaurant).

Collaboration Methods

Local farms can collaborate with restaurants and hotels in multiple ways. One way is by introducing a special organic menu based on a particular season, generally during the winter season. Through this method, the chefs prepare a menu that uses the farm's organic produce along with other organic ingredients. Another way is to package the product and sell it to the business, which they will sell to the end consumer.

Challenges for local farms

According to our interviews with farmers, food wastage is one of the challenges they face. The co-ops and restaurants send the damaged products back to their suppliers or farmers if they work directly with them. As a result, the damaged value of products is deducted from the final bill and businesses pay only for items that have been sold. Furthermore, farmers benefit from more profit by selling their produce directly to businesses. However, farms don't want to sell to businesses directly. It's impractical, transportation costs are huge, and businesses have a strict supply schedule. Hence, farmers find it extremely difficult to avoid the middleman (supplier) and sell directly to the business. Read more about farmers in the "Farmers Analysis" Section.

Supply Chain

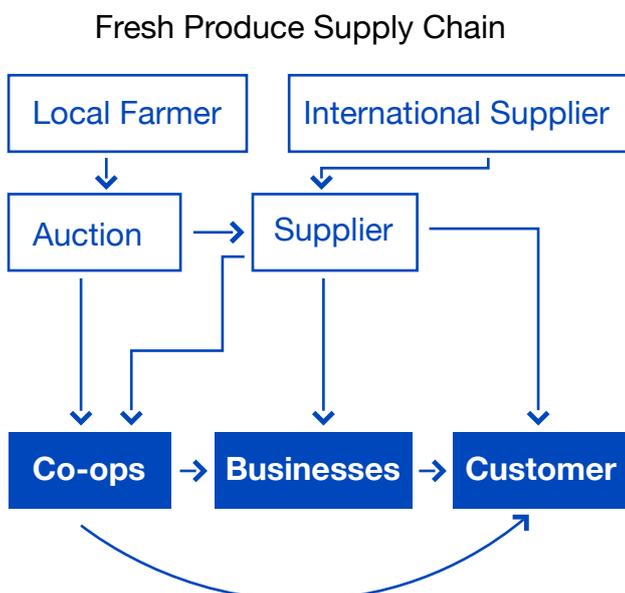
The supply chain system for agriculture in Kuwait is composed of 4 parties: The farmer, the supplier, the business, and the end-consumer. The farming industry follows a traditional supply chain. The farmer sells their produce to a supplier with a strong logistics and inventory management system, and the supplier sells to multiple businesses or to end consumers. Farms are located on the outskirts of the central city, and the law prevents any farms from operating within the mainlands. As a result, farmers avoid selling directly to consumers and instead prefer to sell to suppliers directly.

The businesses in the supply chain mainly include cooperative societies, convenience stores, supermarkets, restaurants, and hotels. Poixel finds that supply chain management is different for each business. Each business has a purchasing/procurement management responsible for procuring fruits, vegetables, poultry, dairy, and other products. Multiple supply chains exist for different firms regarding fruits and vegetables. One of them includes working with one supplier only responsible for getting daily supplies delivered to the firm as per their needs. Some firms have their staff members accountable for buying the daily produce from the farmer's market. Another way is working with 2-3 main suppliers and multiple alternative suppliers. The main suppliers have the largest consumption share due to the product quality, level of trust between them and the business, and supply consistency. Also, in the event that main suppliers will fail to deliver in the upcoming days, the company is shifting to alternative suppliers, hence reducing the risk and affect in operations.

Regarding the product pricing, supermarkets add a 10-20% profit margin on certain imported items such as lebanese potato, chinese carrots and indian or iranian onions. However, supermarkets add nearly 80% margins on certain produce such as local cucumbers, jordanian eggplant, saudi carrots and more. These are the most consumed items and hence the margins are very high.

“We work with multiple suppliers wherein we have 1-2 main suppliers and other alternative suppliers. We don’t sign up yearly contracts but instead provide the majority consumption size to suppliers who have excellent product quality and can consistently supply on the time we need on a daily basis”

Rajab El Arnaout, Group Purchasing Manager at Maki Restaurant



Profit Margins of Supermarkets and Co-ops for Common Fresh Vegetables

| Vegetable | Avg Auction Price | Avg SP | Avg Profit Margin |
|----------------------|--------------------------|---------------|--------------------------|
| Red Onion India | 0.250 | 0.280 | 11% |
| Red Onion Iran | 0.200 | 0.240 | 17% |
| Eggplant Saudi | 0.583 | 1.248 | 53% |
| Eggplant Jordan | 0.167 | 0.773 | 78% |
| Eggplant Kuwait | 0.211 | 0.335 | 37% |
| Potato Kuwait | 0.144 | 0.398 | 64% |
| Potato Lebanon | 0.200 | 0.222 | 10% |
| Potato Egypt | 0.174 | 0.375 | 54% |
| Cucumber Kuwait | 0.100 | 0.579 | 83% |
| Tomato Jordan/Saudi | 0.271 | 0.251 | 46% |
| Tomato Kuwait | 0.138 | 0.545 | 75% |
| Green Pepper Jordan | 0.613 | 0.895 | 32% |
| Green Pepper Kuwaiti | 0.298 | 0.149 | 67% |
| Green Chilli Jordan | 0.638 | 1.000 | 36% |
| Zucchini Jordan | 0.542 | 0.780 | 31% |
| Green Chilli Kuwaiti | 0.542 | 0.904 | 40% |
| Saudi Carrot | 0.210 | 0.995 | 79% |
| Carrot China | 0.471 | 0.560 | 16% |
| Cauliflower Jordan | 0.458 | 0.930 | 51% |
| Cauliflower Kuwait | 0.356 | 0.810 | 34% |

Poixel calculated the selling prices (per KG) for the fresh produce from co-ops and supermarkets. These super markets included Oncost, Sultan Center, Lulu Hypermarket, Grand Hyper, City Center, and Carrefour

The average auction prices were calculated by finding the average of the daily prices per monthly basis

Color codings means as follows: Red signifies low margins, Blue signifies medium margins and Green signifies high margin

Co-ops Analysis

Most consumed produce

According to Poixel's research, 51% of consumers prefer to shop at cooperative societies instead of supermarkets. The best days for co-ops in terms of high influx of customers is Sunday and Monday, since the prices are half off. There are over 40 co-ops located in the entire country. 70% of the fresh produce is imported, while very less of produce is local. The most bought produce by customers includes tomatoes, potatoes, bananas, apples, citrus fruits, watercress, lettuce, and coriander. The supply of local fresh produce is undisturbed from September to April. However, the months of May, June, and July weaken the local produce due to the excessive amount of heat.

Farms

Poixel's research finds co-ops do order supplies from local farms. Some of these farms include Saud Al-Suhaili Farm, Munira Hammoud Farm, Saad Al-Subaie farm, Mai Al-Otaibi Farm, Hassan Al Jarallah Farm, Mubarak Abdul Rahman Muhammad Al-Ajmi farm, among others. Furthermore, co-ops attend farm auctions which are held on a daily basis from 9 am to 6 pm. It is important to note that co-operatives do not buy directly from farmers. Instead, farmers need to sell their produce at auctions to be able to sell to co-ops, from where half of our sample buys their fresh produce from. As a result, farms suffer from low margins and co-ops are able to sell at high margins.

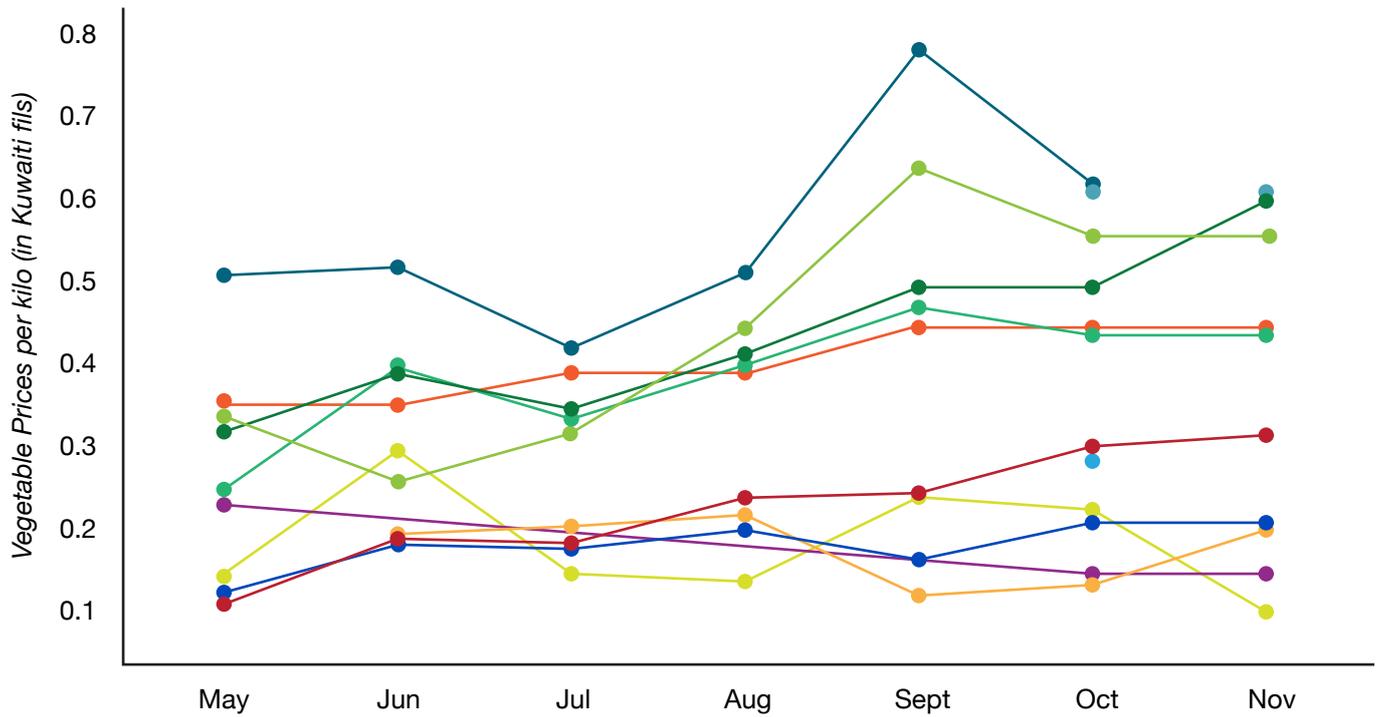
Food Wastage

Food wastage is a critical component in the supply chain. Having high wastage leads to an increase in additional expenditure on transport and warehousing. Co-ops analyze the product and if the product is heavily damaged, it is returned back to the supplier (which can be a company or farmer). The food is inspected at least 4 times per day to ensure its validity. None of the food is reused, recycled, or donated. Furthermore, no such food wastage programs are present within co-ops.

Supply Chain

Co-ops source the fresh produce from suppliers and the farmer's market (chabra). Co-ops work with local suppliers such as Fresh Fruits Co (FFC), Al-Fakhama Express Company, Al-Zamil Company, Khalaf, Talq Al-Otaibi Company, Mishaal Company, Khalifa Al-Jeri, Fourth Soor Company, and the Al-Baqi Company, among others. The product is supplied on a daily basis and costs 50,000-60,000 KWD on a monthly basis, corresponding to 2-3 tons of fresh goods. It is calculated as a sum for all co-ops. Additionally, the criteria for ordering produce is based on excellent quality first, followed by observing consumer demand and ensuring consistency in supply. Regarding the product pricing, co-ops have similar profit margins as supermarkets, with 10-12% difference in final price. *Refer the price table in "Business Analysis" section.* Hence, co-ops too have high margins on high-consumed products such as eggplants, carrots, cucumber and potatoes. However, red onions from Iran and India have the lowest profit margins (around 10%), despite being highly consumed. This is the result of the government intervening to stabilize the supply and prices of imported onions.

Auction prices of Vegetables and their origins, as of May to November 2021



| Vegetables | May | Jun | Jul | Aug | Sept | Oct | Nov | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|--------------|
| ● Jordan Green Chillies | 0.504 | 0.508 | 0.422 | 0.500 | 0.813 | 0.638 | - | 0.564 |
| ● Jordan Green Pepper | 0.319 | 0.319 | 0.341 | 0.404 | 0.453 | 0.478 | 0.613 | 0.418 |
| ● Jordan Zucchini | 0.320 | 0.257 | 0.313 | 0.417 | 0.628 | 0.542 | 0.542 | 0.431 |
| ● China Carrots | 0.347 | 0.333 | 0.408 | 0.392 | 0.471 | 0.471 | 0.471 | 0.482 |
| ● Jordan Cauliflower | 0.258 | 0.402 | 0.327 | 0.394 | 0.475 | 0.458 | 0.458 | 0.396 |
| ● Jordan Tomato | 0.155 | 0.196 | 0.181 | 0.222 | 0.239 | 0.268 | 0.271 | 0.218 |
| ● Yemen Red Onion | 0.156 | 0.185 | 0.179 | 0.198 | 0.167 | 0.194 | 0.200 | 0.182 |
| ● Syrian Potato | - | 0.187 | 0.195 | 0.208 | 0.140 | 0.148 | 0.200 | 0.179 |
| ● Kuwaiti Cucumber | 0.159 | 0.321 | 0.154 | 0.143 | 0.238 | 0.216 | 0.100 | 0.190 |

Avg prices of other items:

| | | | | | | | |
|-----------------|--------------|--------------------|--------------|-----------------|--------------|------------------|--------------|
| Kuwaiti Tomato | 0.138 | Kuwaiti Potato | 0.144 | Kuwait Eggplant | 0.251 | Kuwait Gr Pepper | 0.298 |
| Kuwait Zucchini | 0.500 | Kuwait Gr Chillies | 0.486 | Indian Onion | 0.235 | Jordan Eggplant | 0.191 |
| Egypt Potatoes | 0.172 | Saudi Eggplant | 0.480 | Indian Chillies | 0.720 | Saudi Carrots | 0.210 |

The line graph represents the price fluctuations on a monthly basis. Poixel calculated the monthly rates by averaging the daily product prices for products that don't have an apparent monthly line graph, they are bought during that seasons mainly

Farmers Analysis

Auctions

Auctions are very competitive since the demand for fresh produce is high in Kuwait. The farming industry in Kuwait involves tough regulations and unfair practices from suppliers and co-operatives. Furthermore, when it comes to selling to co-operatives, farmers are unable to sell their local produce directly to coops. They are forced to sell them through auctions through the farmers' association and farmer's market (chabra). We find co-operatives participating in the said auctions on a daily basis. Co-operatives do, however, accept imported produce without the need to participate in auctions. Given that, farmers are able to sell directly to supermarkets or suppliers. Supermarkets, however, are much more difficult to negotiate with because of the strict regulations involving annual contractual fees, the amount paid per sold item rather than the total items purchased, and strict quality criteria.

Prices in auctions are considered very cheap compared to the price the fresh produce has once sold. People can buy the produce from auctions but intermediaries/suppliers cannot buy it from auctions and sell it in coops. Farmer's believe that people look for the local produce, prefer it, and want to support local farmers. But due to the dynamic of the industry, people result in buying imported produce instead. Moreover, even intermediaries/suppliers have resulted in importing fresh produce to be able to directly sell and profit from the coops. Farmers sell their produce at the auctions for a low-profit margin then coops will sell it at a much higher profit margin to the end consumers. On top of that, the regulation that farmers are only able to sell to co-ops through auctions leads to the lowest prices for co-ops but bad margins for farmers.

Supply chain

The ideal supply chain that follows regulations would be as follows: Farmers - packing facility - salespeople (optional) - auctions - coop - end consumer. Some farmers have decided to cut the "middleman" and sell their products online by starting their own business with the farm's name. Intermediaries also take responsibility for the packaging of the fresh produce in order to give incentive to the coops to buy products that they can immediately put on display. Farmers should have separate specialized management to handle the business aspect for them and they should only be concerned with the farming. Farmers believe they can handle the business aspect of the farm when they have no experience or knowledge of managing a business. However, it is vital that they focus on the farming quality produce and leave the rest of the supply chain management to the supplier.

Sales Channels

Farmers have multiple channels to sell their produce, which includes: directly selling to businesses, selling on auctions, or selling at wholesale prices. Wholesale is not profitable for farmers, the best option to sell their produce is the auctions. Wholesale is costly because packaging and transportation are handled by the farmer. As a result, farmers receive terrible margins on their sold produce. Poixel finds that farmers view the restaurants and hospitality industry as not profitable due to their low volume of orders per day. Farmers are reluctant to pass their farms to outside management due to the cost and their desire to keep their business to themselves to avoid commitment with outside parties. As a result, they prefer to have control over the whole supply chain, which is not productive in the long term due to quality control and increasing costs.

Problems & Limitations

The farming industry is not deprived of its own issues. Some issues that farmers face include: unfair auctions, water supply, and electricity getting cut off at random times, traditional farmers have to face the harsh weather and the damage of the crops as a result of it. Moreover, farmers have felt discouraged by the limitations on where they can sell their fresh produce that their productivity has dropped and they are not producing as many crops and produce anymore. A large portion of farmers has decided to keep their farms for their entertainment and relaxation while producing as little as they can.

Local Development

Poixel finds the government has allocated nearly 7 million KWD for the support of farmers. However, some farmers have yet to receive such support. However, the government has placed subsidies on water, electricity, and diesel for all farmers, thus easing their processes. Furthermore, The farmers' association has tried to repeatedly find solutions around the regulation of selling to coops directly but they have yet to succeed in finding the ideal solution for both farmers and coops. To avoid unfair treatment of the farmers, the ideal way to go is to allow the farmers to sell their produce to coops directly. Regarding intermediaries, they have no government support. It is privately handled without government interference as long as it is within the law and regulations put by the government.

Most farmers are aware of vertical farming and they know what it is, however they are discouraged to pursue it because it is expensive and they feel that the ROI will not be enough. Farmers in Kuwait still prefer traditional farming. Very few have done aeroponics and some have greenhouses but they still prefer traditional farming. Farmers are either reluctant to invest in vertical farming or do not have the capabilities to do so.

Permits & Regulations

The farming industry is lacking regulations that will help boost the farming industry. The laws and permits have not been changed since the 70s. Permits are needed for any crops before they can begin growing in Kuwait. These regulations are from the public authority of agricultural affairs. When starting a new company or using a storage facility for the produce, companies are required to get a permit from the ministry of commerce. In order to get a permit some conditions have to be met:

- For each plant, companies need to give the public authority a sample for test and once approved, the certificate is issued for them to grow and sell the produce
- Farm space must not be less than 2000m
- Types of flowers and crops must be registered and approved
- Crops and flowers should be in soil and seeds that are free of any diseases
- The farm should have detailed records of the registered types of crops that are being grown when they started the process, and how the process is going
- Farms will be subject to unannounced inspections and should be ready for it at all times
- Between every crop type, there should be a distance of no less than 150m to ensure the purity of the crop and make sure no mixtures happen.
- The name of the farm should be clear on every avenue, even on the workers' uniform
- Personnel who are managing and running the farm should have a degree in farming or related fields or experience in the farming of no less than five years
- Crops and flowers that will be grown must be suitable to grow in the Kuwaiti environment
- Suppliers have to have a log of all the crops for a minimum of 5 years and they should give it to the business they pitch for their services
- The log should include information related to the fresh produce such as dates it was planted, fertilized, started to grow and it should have every detail related to every crop
- The log must be submitted to the public authority of agriculture affairs first and it should be approved by them before starting to sell and supply to vendors

Top Global Vertical Farms

Global Vertical Farms



Grows microgreens, baby varieties of leafy greens
Partnered with Amazon Fresh, Wholefoods, and Walmart



Provides container farms, IoT farming application, growing materials and farming kits



Farms in Dubai, Beijing, Tokyo
Provides container farms, indoor farms, environment monitoring app and cloud-based SCM



Provides vertical farming racks, cannabis solutions and mobile carriages



Digital monitoring vertical farming system
Subscription for restaurants, supermarkets and malls

MENA Vertical Farms



Operation in Saudi Arabia
Utilizes aquaponics technology
Farm integration support



Retail brand - Fresh box Farms
Partnership with Emirates Catering

Vertical Farms



Indoor farms within supermarkets
Over 600+ farms within Kroger, Madison's, Wholefoods, and Riesbeck



Retails multiple types of lettuces and microgreens
Acquired &ever



Partnered with Qatar's Agro Farm
Produces strawberries, microgreens, leafy greens
Operating in USA, Russia, Finland



Specialized in developing hydroponics science and technology
Based in the UK



Over 550 farms globally
Grows microgreens, baby varieties, mushrooms, aromatic herbs



Based in UAE
Retails hydroponic vertical container farms



Based in UAE
Specialize in gourmet greens such as basil, wasabi, chives & lettuce
Operates B2C and B2B

Product Supply

&ever (now known as Kalera) is a German indoor vertical farming company that combines technologies from the software, mechanical engineering, and agricultural fields. With a global presence since 2015, &ever operates a large vertical farming facility in Kuwait for nearly two years, as of the date of the report. The company builds sustainable farms in cities around the world to supply more people with better tasting produce with higher nutrient content. &ever's patented cultivation systems are scalable in shape and size. Hence, indoor vertical farms of different sizes can be built anywhere in the world, regardless of local climate conditions

&ever was acquired by Kalera Group on October 1, 2021, a company that optimizes plant nutrient formulas while developing an advanced automation and data acquisition system with the internet of things, cloud, big data analytics, and artificial intelligence. Kalera operates farms in Orlando, Florida, Atlanta, Georgia, and Houston, Texas, with plans to open more farms in the US, the Middle East, and Asia in the near future.

Marketing

The brand collaborates with health influencers and brands to promote its products. Within the collaborations, influencers make their favorite healthy recipes using &ever products. Furthermore, the brand focuses on educating its followers through healthy recipes they can make through their products. The brand also collaborated with NBK for its renowned NBK marathon by distributing the products to the participants.

Technology

&ever uses advanced technology (based on SAP) within its farms that provides full digital control over the whole production process, allowing them to optimize production according to the needs and capacities of the farm. Through Internet of Things (IoT) sensors and edge computing devices, the company monitors seeding, germination, and other parameters, such as carbon dioxide levels, temperature, humidity, and airflow, throughout the farmhouse. &ever uses IBsolution, a trusted SAP partner, to support the project with software implementation and development. The process has full control over the entire planting process, including the seeding, germination, propagation of plants, Co2 control, temperature control, and harvesting.

Product Qualities

Their product range includes baby versions of Lettuce, Salad Mix, Spicy mustard, Pak Choi, Kale, and Spinach. Due to their vertical cultivation using a system known as dryponics, the fresh greens do not need to be washed and are harvested right before they are eaten, ensuring high nutritional quality. The brand has tied up with Kuwaitagro to distribute the products to supermarket chains such as City Center, Sultan Center, and Lulu Hypermarket. They also supply to the Four Seasons hotel and restaurants such as Baker & Sweet, and Ora.

Types of Growing Methods

Plants can be grown in various ways in a vertical crop production environment, which is as follows:

Greenhouse farming

Many greenhouses, ranging from small sheds to large buildings, are grown under a controlled environment. Solar energy is absorbed by transparent glass or plastic covering the roof and walls. Greenhouses are primarily used to adapt crops to different growing conditions and to protect crops from unpredictable weather and pests, thus enabling the year-round production of crops

Hydroponics

The hydroponic system uses water, nutrients, and oxygen instead of soil to grow plants. In hydroponics, plants are grown without soil as a more efficient way to provide food and water to your plants. In a hydroponic garden, the roots of the plants are anchored by an inert growing medium and equipped with a unique nutrient formula, which gives the plants more accessible access to food and water. It is a well-known sustainable way of growing crops such as leafy greens, microgreens, peppers, tomatoes, herbs, and strawberries. Many different mediums are available for growing the plants, including sand, gravel, rock wool, coconut fiber, and oasis cubes.

Aeroponics

Within an Aeroponics system, plant roots are sprayed with a nutrient solution and water while suspended in the air. It is common for roots to be in an enclosed environment to catch nutrient mists. Greenhouses typically use aeroponics, which uses sunlight as a primary light source and supplemental lighting when necessary. Aeroponics is the most water-sustainable type of growing, using 90% less water than hydroponics, which are already considered sustainable.

Aquaponics

Aquaponics is a controlled environment method that combines aquaculture (raising fish) and hydroponics. Fish waste (ammonium and urea) and bacteria within an ecosystem provide plants with all the nutrients they need. Aquaponics uses fast-growing fish (tilapia, perch, catfish, and trout) to give the plants nutrients and set up indoors since no soil is involved. Farmers can then recycle water for use by the fish. No chemical fertilizers are required since each species nurtures the other.

Farming Methods

Differentiation between Vertical farming and Traditional Farming

| Factors | Vertical Farming | Traditional Farming |
|----------------|--|---|
| Environment | Indoor controlled environment. Can grow throughout the year regardless of the weather | Outdoor environment. Dependent on the weather and climate. |
| Waste control | Uses soil and water. Nutrients are pesticide-free and can be added to water directly | Uses the most soil and water. Soil and water infected with pesticides Uses a big amount of water |
| Land needed | Does not require large spaces. Less land, higher yield | Requires a large space for farming |
| Crop loss | Little to no crops are lost | Uncontrollable loss of crops due to external factors |
| Fertilizer use | Use of fertilizer for the soil. | Fertilizer is necessary |
| Competition | &ever (major vertical farm) Al-Ghanim & Sons, Faisal farms (hydroponics) | Abdily and wafra farms |
| Cost | 3 to 5 times more costly than traditional farming. 1.3 times more costly than hydroponic farming | Farming costs are low Lower technological investment, and low investment in growing materials |

Traditional & Vertical Farming

Yield

The yield of vertical farms is significantly higher than that of greenhouses while using less space. Vertical farms produce twice as many vegetables per square meter as field farms. But, vertical farming requires huge start-up investment into the IoT infrastructure, agricultural technology and has high operating costs.

Soil

Traditional farming contributes to soil deterioration, which is the loss of arable land due to overgrazing and unsustainable agricultural practices. The use of hydroponic systems, which do not require soil, is an ideal solution to this issue. In vertical farms, farmers replant the same crops repeatedly without having to bother about crop rotation. As a result, farmers can produce greens all year round environmentally friendly.

Space

A greenhouse farm requires much space, such as traditional farming does. In a small space, vertical farming systems produce huge yields because they do not require a lot of space. Farmers can use the same amount of space to grow more crops. The output of one acre of indoor space may be equivalent to that of four to six acres of outdoor space.

Lighting

Plants are organized in a single horizontal plane in greenhouses, relying on natural light. As a result, they need much space and are best suited to suburban settings. Vertical farms are artificially lit and have plants stacked in vertical levels. Furthermore, the atmospheric temperature is controlled for each set of plants to enable efficient growth.

Water Usage

By not evaporating or losing water to the soil, hydroponic methods use 99 percent less water than regular farming. In vertical farming systems, the water is constantly reused multiple times to prevent wastage and efficient use of the resource.

Vertical Farm Architecture

Technology

Vertical farming relies on the controlled-environment agriculture (CEA) approach toward food production. CEA technology provides crop protection from the elements and maintains optimal growing conditions throughout the crop's lifecycle. CEA enables proper controlling of the light, humidity, temperature, and moisture levels within the space for each crop type. As a result, farmers maximize their yield, reduce the influx of pests, and efficiently use resources such as light and water to their advantage.

Structure

Crops in a vertical farm are stacked vertically or horizontally, enabling efficient growth of crops under a controlled environment. The farm structures are usually constructed in a building or a container, similar to Kalera in Kuwait. Containers are used to grow a variety of plants, and they are equipped with LED lighting, hydroponic systems stacked vertically, smart climate controls, as well as sensors monitoring the temperature and humidity of the modular environment.

Produce

Kuwait has a hot climate through March - October during the year. Hence, it is perfect for growing warm-season vegetables such as corn, cucumbers, eggplant, melons, peppers, zucchini, squash, pumpkin, sweet potato, tomato, and watermelon. Since vertical farming has a controlled environment, farmers have flexibility over crop production. The crop variety that can be grown is limited to microgreens and baby varieties of tomatoes, potatoes, lettuce, kale, spinach, and even strawberries.

Growing Mediums

Soil is not required as a growing medium for vertical farms. The growing medium differs for the farming method used. A hydroponic growing system, for example, utilizes water basins that contain nutrients. Water is recycled throughout the system, reducing the total water consumption. Furthermore, Aeroponics does not require soil to grow plants. A controlled environment or mist is used to grow crops in an alternative medium such as coconut husk. Nutrients are delivered directly to the roots of the crops, which saves water and reduces labor. Aquaponics, on the other hand, involves growing plants and fish. A closed-loop food production system ensures that the fish and the plants benefit each other. The plants provide the fish with essential nutrients, and the fish supply the plants with helpful bacteria.

ROI vs Operating Costs

Vertical farming startup and recurring costs are extremely high. Hence, businesses that wish to begin a vertical farm in Kuwait need to understand the ROI. **Poixel's research finds that the majority of farmers in Kuwait do not want to adopt sustainable farming due to lack of government support, heavy costs, and lack of knowledge of the industry.** Furthermore, supermarkets are interested in selling locally-made organic produce to end consumers. These are supermarkets whose criteria of buying organic produce is to have new and premium quality produce for customers. Hotels and restaurants have limited interest in buying organic produce, due to managing costs and low consumer interest towards organic produce. Poixel's research shows 74% are willing to pay more for healthy and pesticide-free produce. However, willingness is not equal to paying for organic produce. Hence, the industry requires advertising material and government support to educate society towards actions of sustainability.

Vertical Farming: Pros & Cons

Pros of Vertical Farms:

■ Crop production increased year-round

Maximizing yields through big data and predictive analytics. Farmers can grow more crops by vertical farming by utilizing the exact amount of space in the growing area. The indoor area can produce as much as 4-6 acres of outdoor space. Vertical farming technology can also grow crops year-round in a controlled environment inside an enclosed space.

■ Efficient water usage

Vertical farming allows farmers to produce 70% to 95% less water than traditional farming methods. As a result, it's being pushed by international governments and scientific institutions as the future of farming that efficiently uses resources to grow crops.

■ Not Affected By Unfavorable Weather Conditions

Field crops are susceptible to extreme weather conditions such as floods, cyclones, or severe droughts - events that are becoming an increasingly common result of global warming. During unfavorable weather conditions, indoor vertical farms are less likely to be affected, so harvest output is more predictable and calculated.

Cons of Vertical Farms:

■ Feasibility unsure

The financial feasibility of a vertical farm in terms of generating profitable ROI is still questionable, given that the initial investment and operating costs are extremely high. Poixel's interview with Pip Horticulture, a manufacturer of a vertical farm in the USA, finds that the cost for a vertical farm is close to \$400 per sq ft

■ Manual Pollination

Pollination in the traditional farm happens naturally where the pollens travel through by wind or carried by insects. But, this process is done manually in vertical farms because there are no insects. Pollination is essential for the growth of fruits such as tomatoes. Pollination must be done manually, which will be labor-intensive and adds to the expense.

■ High technology involvement

Lighting, temperature, humidity, and other aspects of vertical farming are highly dependent on technology. A vertical farm can be severely impacted by a loss of power for even a single day.

■ Crops types and price

Vertical farms being an efficient way of growing crops, it's currently limited to leafy vegetables. Although potatoes can be grown in multiple ways, such as aeroponics, it's a baby variety. Furthermore, the pricing of the produce is 30% higher than traditional full-grown crops.

Vertical Farming Porter's Analysis

Supplier Power

The suppliers are the farmers who grow the produce and the buyers are the co-ops and supermarkets. Suppliers cannot sell their produce directly to co-ops. Instead the produce goes through auctions where the co-ops bid on the produce and would buy them. When it comes to selling to supermarkets, farmers are able to directly sell and supply supermarkets. However, supermarkets have their own rules and regulations when it comes to choosing suppliers, supplying schedules, annual contracts, and fees per sale. This makes it hard for farmers to sell the produce directly in the supermarkets.

Threat of new entrants

Vertical farms are becoming more popular throughout the world and in Kuwait. National investments are benign made within neighboring countries such as the UAE and Saudi Arabia. However, farmers in Kuwait are unaware of vertical farms and have expressed their concerns on running such a heavy-investment farm with lower ROI expectations. The influx of new entrants into the market will take a few years as the industry attracts attention, new talent and investors. This will help with the awareness between the end consumers and also start the change in the current farming industry

Competitive rivalry

The competitive landscape for vertical farming is non-existent as there is only one operating vertical farm in Kuwait. Direct competition has not yet been developed as of 2021. Traditional farms and hydroponic farms are considered as competition as there is not yet any awareness between the end consumers as to what the difference between the farming methods are. Farmers compete to have their produce sold at auctions for co-ops since co-ops are the biggest retailer for their produce.

Threat of Substitutes

Vertical farming is new to the Kuwaiti market with only one major vertical farm as of 2021. Vertical farming is an innovative technology and has many benefits to society. However, our research finds that 72% of the sample are unaware about vertical farming. Hence, the majority would likely not purchase organic produce consistently over traditional produce (which is 30% lower than vertically-grown produce). Traditional farming produces the cheapest crops in Kuwait, and they sell cheaper than any other type of farming. Without proper awareness to the end user, vertical farming will be viewed as an expensive and unnecessary extreme to growing produce. It will be thought of in the same light as organic produce that is only accessible for people with higher incomes. The lack of awareness will result in the end consumers buying traditional produce, thus creating less demand for the vertical farms. With the low demand, co-ops and supermarkets would not supply their shelves with the produce from vertical farms.

Buyer purchasing power

The direct buyers in this chain are the co-ops and supermarkets. The purchasing power of buyers is considered much stronger than the suppliers' power, therefore pricing and other factors depend on the buyer and not the supplier in this case. Since farms cannot directly sell their produce to the co-ops, they participate in auctions where the co-ops ultimately choose the price of the produce. Recently however, some farms have been directly selling their produce to the end consumer through their farms and online platforms. When selling the produce online, the final price is up to the farmers and it is not negotiable. The end consumer is usually satisfied with the price since it is sold for less than co-ops. When selling the produce on farms however, some negotiations and bargains can take place between the farmers and consumers.

Vertical Farming SWOT Analysis

SWOT Analysis: Analyzing the strengths, weaknesses, opportunities and threats

Strengths

- Innovative concept
- All-year-round growth, regardless of the season
- Less resource usage than traditional farming
- Low loss of crops due to no pesticides & insects
- Efficient use of spaces for planting
- Less waste compared to traditional farming
- Maintain food security

Opportunities

- Venture into B2B to supply supermarkets & co-ops
- Solar-powered farm
- 74% of consumers willing to pay for organic
- 24% look for produce from vertical farms
- Build a vertical farm in the main city
- Partnership with global vertical farm developers

Weaknesses

- Expensive startup and operational costs
- High usage of electricity, against environment
- Not common in Kuwait
- Still being tested and studied
- Only certain greens can be grown
- Not enough data on vertical farming

Threats

- Outdated farming regulations
- Crop damage by pathogens and pests
- Competitors joining the market, low market share
- Unable to meet B2B demand when starting out
- Not getting acceptance from the market
- Tough regulations for vertical farms of Kuwait

Flowers Analysis

Flower Stores Analysis

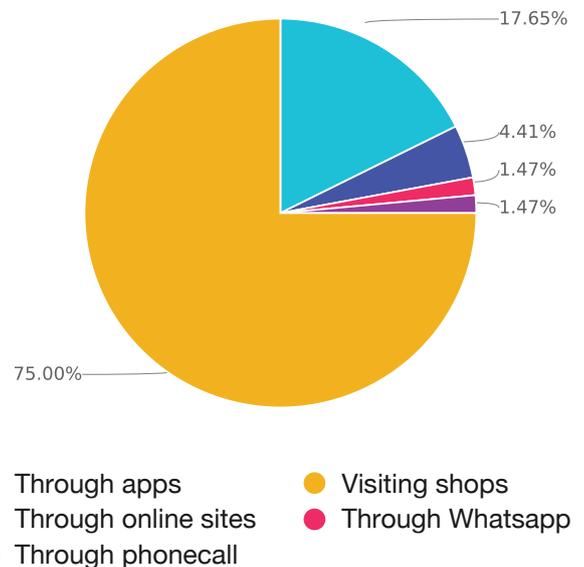
Poixel interviewed flower shops to understand their business model and consumer behavior. We find the best-selling flowers of 2020-2021 are orchids because of their longer life span. It's been the trend for a while since COVID-19 started. All of the businesses have wholesale suppliers that they deal with on a regular basis. Since there is an issue recently with workers, the suppliers are not meeting the demand and have been raising the prices. If they meet the demand they prioritize who gets the better shipment, smaller less established flower shops do not get the better quality than the bigger more established shops. Once the shipments have been made and the suppliers are short or have sent lower quality items, the shop owners would have to find alternatives in the “mashatel” area, which is more expensive than a wholesale supplier and just adds to the total cost. Once flowers start to wilt, the shop owners try to replenish them as best as they can, once they cannot restore them they put them on discount, (which actually sells even though customers know it is wilted or near the end of its lifespan). Once flowers are beyond replenishment, some owners discard the flowers, others give them out to their families and close friends to decorate their houses before the flowers die.

B2C Analysis

The flower industry can be split into two sections: garden flowers and decorative flowers. Consumers buy the decorative flowers as gifts or to keep around the house for some time. The garden flowers, on the other hand, are planted in the consumer’s garden and maintained. Decorative flowers have a typically shorter lifespan than the garden flowers especially if they are in an arrangement or bouquet and without any soil unlike the garden plants.

The garden plants are used by consumers who have gardens in their homes and like to keep them decorated with colorful plants. Some of the consumers enjoy buying the flowers as seeds or as already grown flowers and plant them themselves in their own gardens. Other consumers prefer to hire gardeners to do the planting for them. Some gardeners offer the flowers from their own shop while others just offer the labor while the consumer provides the seeds or flowers. Those with higher income and have gardens to hire someone to do the planting for them. Poixel finds 75% of individuals prefer to buy flowers by visiting shops directly. Hence, in-person touch is essential for consumers while shopping for flowers. The next preferred way is through applications, preferred by 18% of the sample. As a result, Floward and Bleems are the top used apps for the same. 40% of the sample uses apps to buy flowers for special occasions. The reason being it’s convenient and easy to gift individuals.

Preferred way of buying flowers

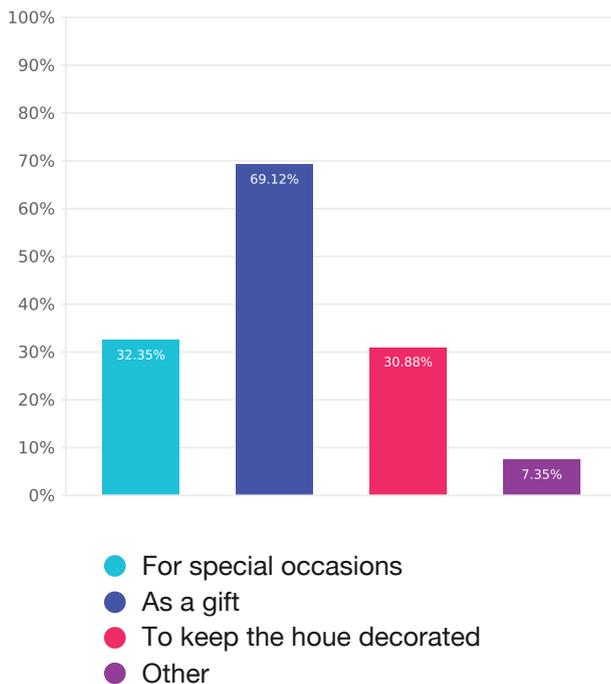


Social Behaviour

(snippet from our 2019 report)

Poixel’s 2019 research on cake and gifts market finds that 77.5% attend at least five social events in a year. Moreover, 64.2% of the sample prefer to buy gifts during the discount period, making sure to save on gifts as much as possible. Despite this, only 26.7% would prefer to send gifts without coming in person. People value giving gifts to their loved ones while being there with them. Also, 41.7% would like to buy gifts through online applications and websites, while the rest don't. The main reason why consumers prefer to purchase flowers and gifts alike online is because of the convenience. Consumers can easily pick flowers for special occasions and get them delivered at their preferred time.

Reasons for buying flowers



Online Market Analysis

(snippet from our 2019 report, updated for 2022)

The online gifts market in Kuwait comprises well-known competitors such as Floward, Bleems, Talabat, and others alike, which provide an online platform to local gifts and flowers shops.

Bleems

Market Preference 27%

Bleems operates in five countries in the MENA region, including Kuwait, Oman, Bahrain, Saudi Arabia, and the UAE. From the company's website analytics, Poixel finds that platform has been receiving average traffic of 8,000 visitors every month from 2020 to the end of 2021 from Kuwait, the highest among other countries. The brand is 61% of its total traffic from Kuwait, while 11% comes from the USA.



Market Preference 45%

Floward is an online flowers and gifts company operating in 9 countries, including Kuwait, Saudi Arabia, Oman, Qatar, Bahrain, UAE, United Kingdom, Jordan, and Egypt. 79% of the brand's web traffic comes from Saudi Arabia. Furthermore, the Floward app is ranked among the top 20s in the Google play store in Saudi Arabia*. Hence, a large consumer base is from Saudi Arabia, while only 8% is from Kuwait

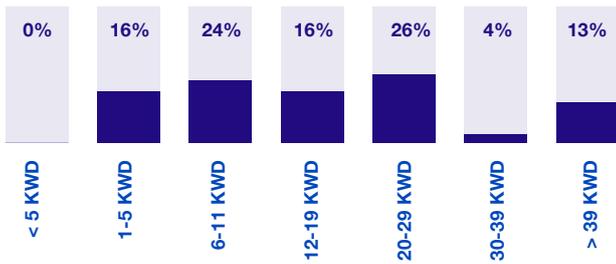
Individual online stores of flower stores are used by very few individuals for online purchasing. Rather, consumers prefer to shop in-store through them. Brand such as Carriage and Talabat receive a 9% consumer preference, making them a low contender in the market.

Purchasing Expenditure

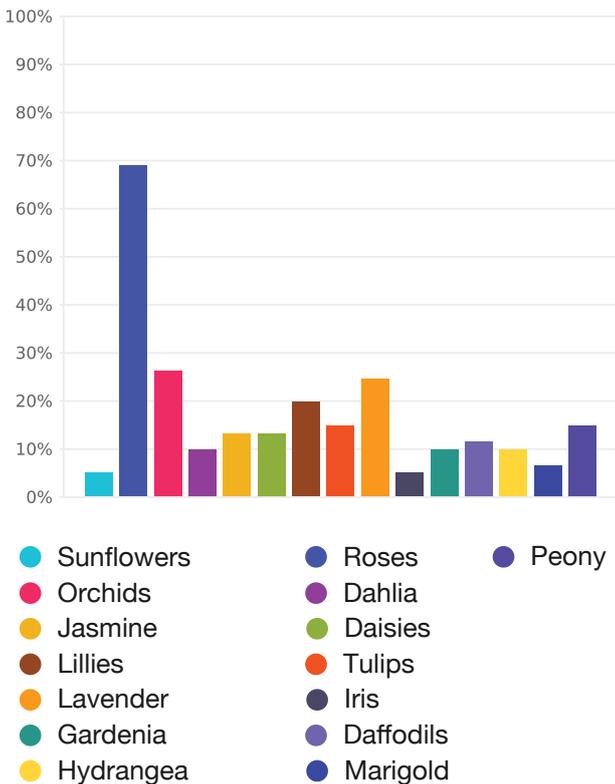
The average expenditure on flowers in 6-11 KWD and 20-29 KWD for elaborate bouquets. It is apparent that consumers typically spend between 20-29 Kuwaiti dinars when purchasing from flower shops. Those with lower income have expressed that buying flowers is their preferred way of congratulating someone on a special event while those with higher income prefer an elaborate gift and flowers.

When consumers buy flowers they are driven by several factors when making a choice. The color and type of flower are the two most important factors when buying flowers, preferred by 59% of consumers. Furthermore, the type of flower is the next thing consumers look for. There are multiple types of flowers. However, the most popular ones are lillies, roses, orchids and lavender.

Typical expenditure on flowers

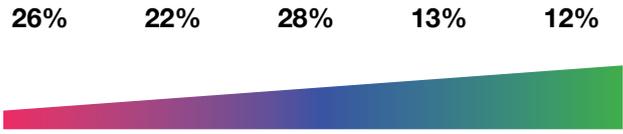


Most purchased Flowers



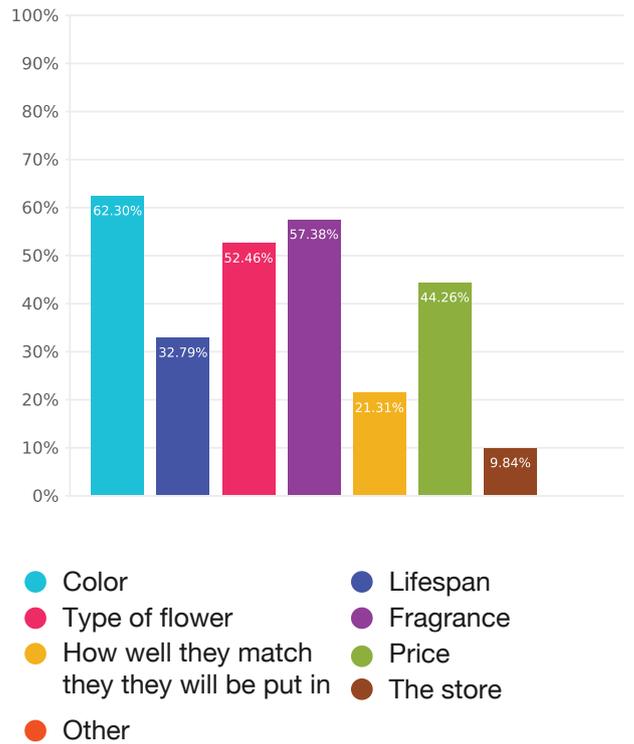
Subscription Plan

Flowers have a limited shelf life whereby they last for 12-18 days. Poixel finds 30% of the sample buy regular flowers to keep their houses decorated at all times. As a result, introducing subscription plans will be fruitful for flower shops since consumers who regularly order fresh flowers can subscribe to. However, our survey finds that 25% would be interested in such a plan. This is because they don't mainly buy flowers regularly. Majority are neutral towards the subscription idea.



How likely would people subscribe to a program that deliver flowers to them twice a month

Purchasing criteria when buying flowers



Flower supplies costs in Kuwait, relevant in 2022

| Flower Type | Units | Price |
|----------------------|-------------------|---------------------|
| Baby Orchids white | Bunch of 10 Stems | 1.500-1.750 |
| Baby Orchids Mix | Bunch of 10 Stems | 1.500 |
| Roses Mix | Bunch of 25 Stems | 4.500 |
| Baby Roses | Bunch of 10 Stems | 2.500 |
| Eucalyptus cineria | Bunch of 30 grams | 2.500-20.250 |
| Trachelium | Bunch of 10 Stems | 3.750 |
| Hypercum | Bunch of 10 Stems | 2.500-2.750 |
| Petus perum small | Bunch of 5 Stems | 1.250 |
| Carnation egypt | Bunch of 20 Stems | 2.000 |
| Gypsophylia | Bunch of 25 Stems | 5.000 |
| Ruscus | Per stems | 0.130 |
| Solidago | 25 pcs | 2.000-2.500 |
| White wax | Per stems | 0.300-0.350 |
| Pussy willow | Per stems | 0.300 |
| vanda | 1 pcs per stems | 1.750 |
| Oriental flower | Bunch of 10 Stems | 7.500 |
| Hydrenga Mix | Per stems | 1.350 |
| Hydrenga White | Per stems | 0.650 |
| Philinopsis cut | Per piece | 3.750 |
| Salex | Per stems | 1.00 |
| Pittosperum Big Leaf | Per stems | 2.250-1.750 |
| Eskimia | Bunch of 10 Stems | 2.500 |
| King Protea | Per stems | 3.500-3.250 |
| Small Protea | Per stems | 1.250-1.000 |

Continued over next page

Flower supplies costs in Kuwait, relevant in 2022

| Flower Type | Units | Price |
|------------------------|--------------------|--------------------|
| Astilbe | Per stems | 0.350 |
| Stalica | Per stems | 0.350 |
| Eryngium | Per stems | 0.350-0.325 |
| Anthrium | Per stems | 1.000-0.900 |
| Flat moss | Per box | 2.750 |
| Cotton balls | Per stems | 1.250 |
| Lavender | Per bunch | 2.000 |
| Rice Flower | Per stems | 0.550 |
| Wheat | Per bunch | 1.250 |
| Floral foam | 20 pcs per box | 3.500 |
| Chrys mix | Per stems (10 pcs) | 1.250 |
| Hyacinthus | Per bunch | 2.750-2.500 |
| Phalanopsis Plant | 3 stems | 5.750 |
| Connifer | Painted | 4.000-4.250 |
| Sunflower | Bunch of 10 Stems | 3.500-5.500 |
| Hydragenia Color | Per stem | 1.750 |
| Hydragenia White | Per stem | 0.500-0.750 |
| Lily Oriental | Bunch of 10 Stems | 7.500-9.000 |
| Paeonia | Per stem | 1.200-1.800 |
| Rose david austin | Per stem | 0.900-1.200 |
| Rose Garden | Per stem | 0.600 |
| Rose normal | Per stem | 0.180-0.200 |
| spray rose / mix color | Per stem | 0.250-2.750 |
| spray Rose Gardern | Per stem | 0.500 |
| tulip / mix colors | Bunch of 10 Stems | 2.500-3.250 |

Flower supplies costs in Kuwait, relevant in 2022

| Flower Type | Units | Price |
|----------------------------|-----------------------------|--------------------|
| Tulip Doubled / mix colors | Bunch of 10 Stems | 3.000-3.750 |
| Tulip parrot / mix colors | Bunch of 10 Stems | 3.000-3.750 |
| Eucalyptus cinerea | 300 grams (4 to 8 stems) | 2.500 |
| Eucalyptus Baby Blue | 300 grams (4 to 6 stems) | 2.750 |
| Eucalyptus painted | 300 grams (6 to 10 stems) | 3.750 |
| Eucalyptus parvifolia | 300 grams (4 to 6 stems) | 1.750 |
| Eucalyptus populus grains | 300 grams (6 to 10 stems) | 3.000-3.500 |
| Pittosporum small | 300 grams (4 to 6 stems) | 1.350 |
| Pittosporum Big | Bunch of 10 Stems | 2.250 |
| hydrangea plant | Per pot | 6.000 |
| Orchid phalanopsis | Per pot | 5.500 |
| Gardenia | Per pot | 0.150 |
| Dried Eucalyptus Autum | Bunch approx 3-5 stems | 2.500-3.000 |

Flower's Porter's Analysis

Supplier Power

Supplier power refers to the degree of control a firm can exert over its buyers. The Kuwaiti market is saturated with flower shops and applications that sell flowers. The number of flower suppliers, however, is not as much as the shops. Since there are more flower shops than there are suppliers the power lies with the supplier. Flower shop owners make sure to establish a good relationship with the suppliers in order to guarantee their demand is met by the suppliers. Suppliers prioritize orders based on the size of the flower shop, the size of the order, and the relationship with the shop owner.

Prices and the availability of the flowers also only depend on the supplier, they rarely negotiate the prices with newer and less established flower shops and they are already in precious agreement with the older and more established shops. However, this has changed due to the COVID-19 pandemic, as more workers are leaving Kuwait and not many returning there has been a shortage in supply. The shortage has caused some suppliers to re-evaluate their prices and relationships with some shops, prices started to increase and suppliers have to choose which shops will get the flowers once they are limited.

In the case of an increase in prices or a shortage in specific types of flowers, flower shop owners are forced to go to flower retailers like AIMashatel in order to make up for the shortages. The flower retailers are relatively higher priced than wholesale suppliers, however, since flower shops have no other choice they are forced to pay the higher price and make less profit than expected.

Buyer Purchasing Power

Purchasing power is the ability of consumers to pay for goods and services. The coronavirus pandemic has affected the retail sector greatly in the past two years including the flower market. The flower industry was forced to adapt to the pandemic due to changes in regulations and market dynamics. Some businesses could not succeed resulting in their closure, others came up with tactics and strategies to get them through the pandemic. Employment for the Kuwaiti market has not shifted greatly due to the pandemic as compared to the rest of the world which has caused little to no effect on the consumer purchasing power. Since the Kuwaiti market's employment status was not greatly affected by the pandemic, the purchasing behavior of consumers buying flowers has not decreased. Some of the consumers have actually invested in flowers for their gardens and have been sending flowers for their loved ones to congratulate them on certain occasions.

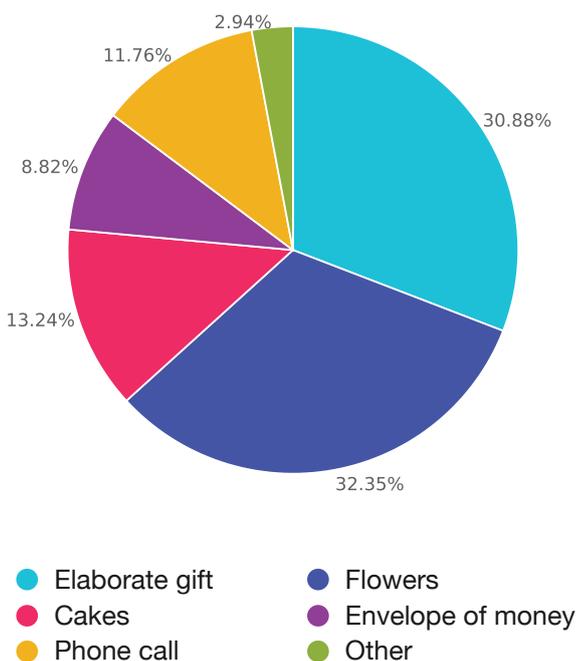
Kuwaiti society uses flowers as a way to express appreciation to their loved ones or to congratulate friends and family on milestones. When asked how people prefer to congratulate someone on a special occasion, 35% (the majority) of the respondents choose "sending flowers" as their preferred method of congratulating. This shows the importance of flower shops and the market demand for flowers increasing the buyer purchasing power. As long as the demand for flowers in the Kuwaiti market remains as it is or increases, the buyer's purchasing power will increase. Once buyers lose interest/demand, the buyer purchasing power decreases therefore decreasing the value of the market.

Threat of Substitutes

Substitutes are other products that could be purchased outside an industry by customers. The flower market in Kuwait is very popular and has a high demand. There are, however, substitutes to the flowers being sold in the market. Artificial flowers have become popular as home decorations since they do not change their appearance or attract bugs. In addition, they are cheaper and require no maintenance, which is why people prefer them over real flowers.

Flowers are also used as gifts to loved ones to send congratulations or show appreciation. However, there are other ways to send congratulations or show appreciation. According to our survey, 30% of consumers prefer sending elaborate gifts, 9% prefer giving envelopes with money, and 11% just prefer to call rather than send gifts. Our study finds nearly 30% of married couples have equal preference over sending flowers and an elaborate gift. Furthermore, a phone call is a common minority for both single individuals and married couples. Money is preferred by 12% of married couples as well, as opposed to popular gifts. Hence, due to the many substitutes available, flower stores need to focus on a defined target audience to enable sustained growth.

Preferred way of congratulating someone on a special day



Threat of new entrants

Even with a saturated market such as flowers, there is always a new entrant into the market. Although innovation is difficult to achieve in the flower market, creativity is not. Entering a new market with a different approach to flower shops can help set the new entrant apart and gain attention from the consumers. The flower market is a market where creativity is needed to set competitors apart and to remove competitive pricing. Creativity gives the market room to accept new entrants and for those entrants to succeed in gaining some market share and competing with more established flower shops.

Poixel's survey finds only 10% of individuals value the store from where they shop flowers from. Hence, consumers value the characteristics of the flower, price, and the social event that influences them to purchase the flower. In other words, as many flower stores are set up, it will not pose a great threat to existing stores. However, stores need to focus on product quality, pricing, and customer service to excel at their business.

Competitive rivalry

Competition among existing firms is measured by competitive rivalry. Intense competition can limit profits and force brands to cut prices, increase advertising expenses, improve services, or innovate. The Kuwaiti market is highly competitive when it comes to flower shops. Different outlets cater to different target groups. It is difficult to be innovative and gain a competitive advantage, however, it is not impossible. Competing on price is not ideal since each shop prices the flowers based on their target audience, types of flowers, cost, and the type of arrangements. Furthermore, consumers do not base their purchase entirely on price but rather on other factors such as the fragrance, type of flower, and color, as our research finds. Therefore, to succeed at their business, stores must focus on product quality, pricing, and customer service.

Business Models

It is essential to understand which business model to adopt before entering the market as a supplier, farmer, packaging house, or retail business. A business model shall identify the products or services to sell, the target market and the anticipated expenses of running the business. Poixel finds the following business models that is applicable, but not limited, to the fresh fruits and vegetables industry in Kuwait:

Production or Import

At this stage, farmers are involved in the production of fresh vegetables and fruits. Kuwait has a hot climate through March - October during the year. Hence, the common produce that is grown includes warm-season vegetables such as corn, cucumbers, eggplant, melons, peppers, zucchini, pumpkin, tomato, and watermelon. However, over 90% of the produce is imported from 50 countries, mainly from Saudi Arabia, Egypt, Jordan, Lebanon, Yemen, Sudan, Syria, Iran, India, Pakistan, USA, and Holland. The produce is imported by local suppliers from where they are packaged and delivered to businesses. Local farmers need to focus on product quality and consistency of supply to become attractive to suppliers. Due to high supply costs and businesses' preference to work on a credit basis with food suppliers, farmers should not deal directly with businesses.

Handling and Storage

In the case of produce from local farms or imported from abroad, the suppliers buy it and store it at their warehouses. These are cold storage facilities that are designed to preserve the fresh produce for long-term, until they are sold to the retailer or business. Oftentimes, certain businesses shall perform a warehouse inspection before deciding to work with the supplier. Within the inspection, the warehouse cleanliness is observed, along with pest control, temperature settings for different produce, and quality of produce.

“We choose our supplier based first on the price of his produce, quality, and his portfolio, while also asking their clients to rate the supplier’s services. After which, our team would go to the warehouse location and inspect the quality of produce, the temperature in the environment, and the cleanliness. Once satisfied, we sign a 1-Year long agreement.”

Mr. Mirza Farooq Akram, Multi Property Purchasing Manager at Marriot international

Value Chain of the Industry



Processing and Packaging

Packaging and pricing are the two most important factors in marketing the product. The produce needs to be processed and packaged to be sold to supermarkets and co-operatives. Often intermediaries/suppliers take responsibility for the packaging of the fresh produce to act as an incentive for co-operatives. In this way, co-operatives are able to immediately display the items.

Distribution

At this stage, supermarkets and co-operatives have tied up with distributors who then send the packaged produce to them. Farms or can work with distributors to transport the packaged produce to businesses. Some distributors will have a packaging house too and hence, would buy the produce directly from farmers.

Market

Once produce is bought by suppliers either from abroad or local farmers, they shall market their produce to businesses such as hotels, restaurants, supermarkets and co-operatives. Marketing is a crucial part of signing an agreement with the business for the product to be sold to end customers. The responsibility to market the produce will be of the supplier, who shall invest in a proper online presence and a solid sales team that shall meet with the purchasing department of businesses. Suppliers shall submit their list of product prices, after which the product quality and supply past work shall be observed.

Future Outlook

Solar Power

Kuwait is a good location for solar energy developers considering its average daily insolation of 5.2 kWh/m²/day and maximum solar hours of 9.2 hours a day. During the year, the country receives an estimated 2100 - 2200 kW/m² of solar radiation, one of the highest levels in the world. Hence, vertical farms that utilizes solar power will have a greater impact on the environment.

Location for vertical farms

The main benefit of vertical farms is the sustainable production of daily products such as herbs and vegetables that seek to minimize land and energy usage to impact the environment positively. As a result, the location of the vertical farm should be in an area that makes it accessible to society and lowers transportation costs. Furthermore, the lower transportation distance between the farmer and the end business, the higher quality produce will be.

B2B Selling

Businesses in the restaurant and hotels industry require a consistent supply of produce daily. Furthermore, they need a consistent quality of products to lend a decent consumption size to vertical farms. Furthermore, vertical farms need to provide competitive pricing to the above industry similar to what they are currently paying for the supply of fresh produce. In summary, farms must focus on constant quality, consistent supply, and competitive pricing to gain a decent consumption size from restaurants and hotels.

Collaborative Effort

Developing sustainable vertical farms in Kuwait requires close collaboration between the government, science organizations, and the industry. It is through joined efforts and aligned mission towards a sustainable future that can make the success and adoption of the technology quicker within the country.

The Idea of Organic

Poixel finds that few customers look for products labeled organic. Ultimately, customers want transparency so they can feel confident that their food consumption is safe, nutritious, and produced sustainably. Hence, such characteristics need to be present in all kinds of produce and food items, regardless of whether they are labeled organic or not.

Limitations

Some of the limitations of the industry are based on the current government regulations. The farms cannot directly sell to the biggest retailers; farms have to go through auctions that are sometimes unfairly planned. It is difficult for farms to export their products out of the country unless with pre-planned government approval. Another limitation would be the management of farms. Farms should be handled by experienced farmers, however, a business team should handle the management aspect of the farm and the selling of the produce. Experienced personnel are required for the business as farmers usually do not have business experience. Having an experienced team handle the pricing, exporting, and sales of the produce would remove the burden from the inexperienced farmers.

Conclusion

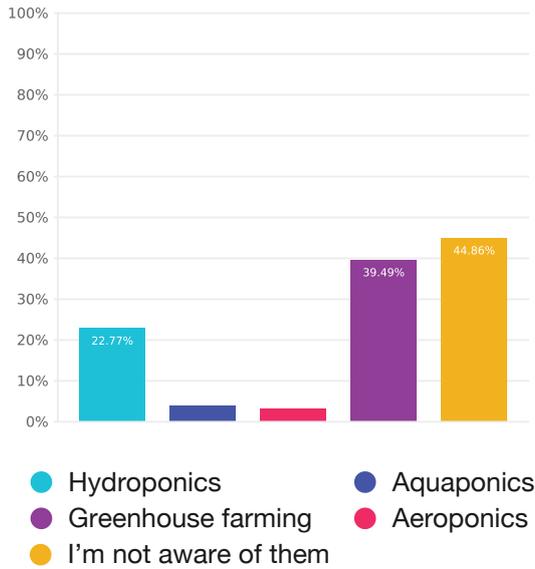
Government support is essential to developing a sustainable agriculture system within Kuwait. Currently, the growth of sustainable farming and the AgTech industry is minimal due to lower governmental interest. However, the governments within neighboring countries such as the United Arab Emirates (UAE), Oman, and Saudi Arabia have already invested huge sums into developing the sector. The main driving forces for the investment include preserving food security, lowering the reliance on global food imports, increasing local production and exports of fresh produce.

Previously, governments relied on acquiring land from outside the country to lower food imports. However, during COVID-19, countries closed their borders, and as a result, Kuwait experienced a shortage of supplies. Such an event is a vital risk for countries that can hinder food purchases and, as a result, affect the economy. As a result, investing in the AgTech industry is of vital importance.

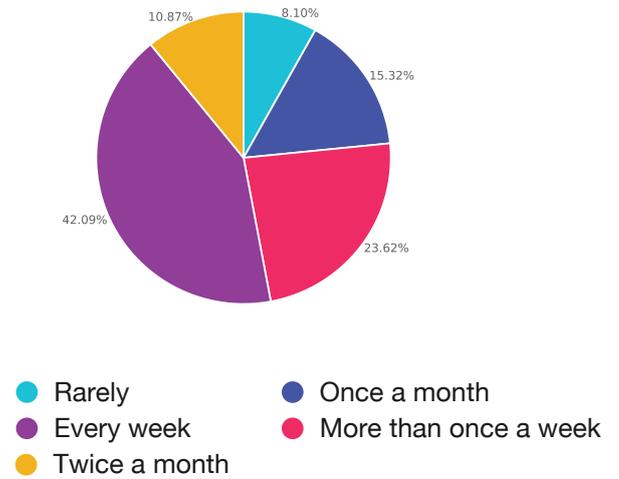
Kuwait relies on importing nearly 90% of its food imports. The agricultural industry contributes a bare minimum of 0.5% to the GDP. Furthermore, due to the arable land being limited to 4.5%, lower rainfalls annually, higher average income within locals and diversified imports, the country is able to circumvent food security risks in the future.

Appendix

Types of farming methods people are aware of

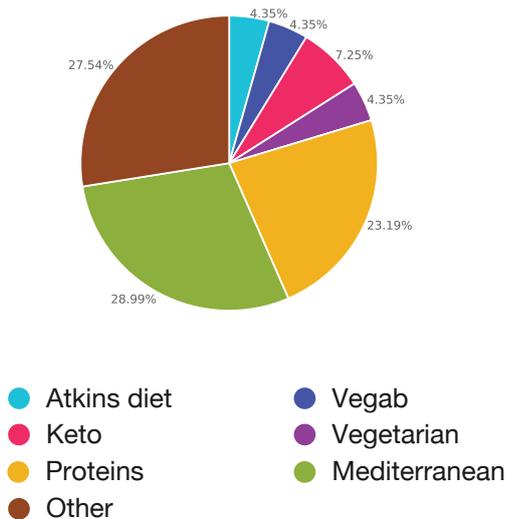


Frequency of buying fruits and vegetables

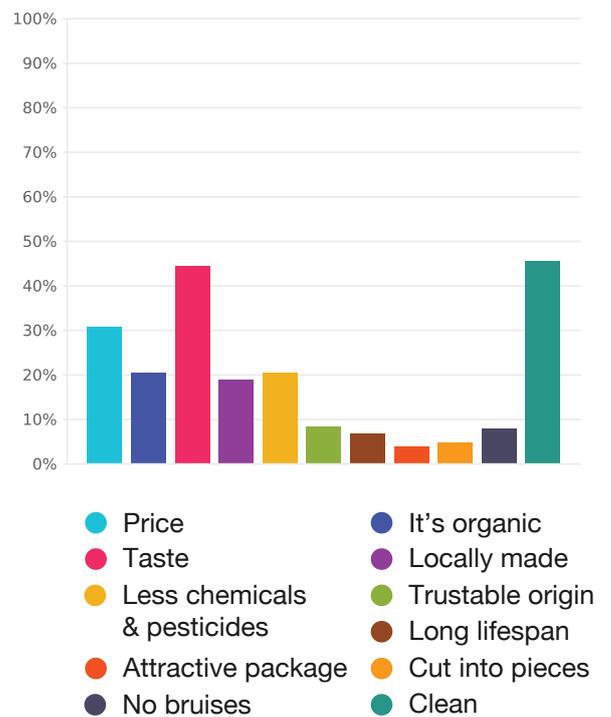


Those who follow a diet, which diet do they currently have

3.1% of the sample follow a diet



Three important factors when shopping for fresh produce



Appendix

Co-ops Fresh Produce Prices

| Produce | Price |
|----------------------------------|-------|
| Tomato Kilo Kuwait | 0.295 |
| Baby corn | 0.440 |
| Parsley (Jaad AlHarbi Farm) | 0.355 |
| Spinach (Jaad AlHarbi Farm) | 0.395 |
| Watercress (Jaad AlHarbi Farm) | 0.485 |
| Mint (Jaad AlHarbi Farm) | 0.485 |
| Spinach buds (Jaad AlHarbi Farm) | 0.880 |
| Shabant (Jaad AlHarbi Farm) | 0.485 |
| Baby lettuce leaf Kuwaiti | 0.700 |
| Salad Leaves | 0.700 |
| Basil Baladi (Jaad AlHarbi Farm) | 0.485 |
| Baby Bak Choi | 0.700 |
| Baby spinach | 0.700 |
| Dutch red radish bag | 0.275 |
| Jordanian Flower | 1.495 |
| Small Indian green pepper | 1.100 |
| Belgian tomatoes | 2.200 |
| Saudi Pumpkin | 0.285 |

Co-ops Fresh Produce Prices

| Produce | Price |
|-----------------------------|-------|
| Jordanian White Cabbage | 0.295 |
| Jordanian Red Cabbage | 0.335 |
| Arab-Jordanian lettuce | 0.440 |
| Spinach (Jaad AlHarbi Farm) | 0.395 |
| Chinese Ginger | 0.800 |
| Turkish Lemon | 0.395 |
| Brazilian lemon | 0.535 |
| Jordanian Zucchini | 0.595 |
| Egyptian red chili pepper | 1.375 |
| Jordanian pepper | 0.495 |
| White onions | 0.440 |
| Radish | 0.385 |
| Beetroot Saudi | 0.495 |
| Turkish apples | 0.550 |
| Italian Baby Spinach | 0.715 |
| White Cabbage Kilo | 0.550 |
| Flower Kilo | 0.660 |
| Lemon Green Kilo | 0.880 |

Appendix

Co-ops Fresh Produce Prices

| Produce | Price |
|------------------------------|-------|
| Turkish lemon | 0.660 |
| Sweet colored pepper | 2.200 |
| Radish kilo | 0.770 |
| Chili pepper | 1.675 |
| Chilly Pepper Saudi | 0.550 |
| Green Chili Cardboard Kuwait | 0.220 |
| Eggplant Kilo Kuwaiti | 0.385 |
| Red Cabbage Kilo | 0.550 |
| Onion large bag | 1.595 |
| Onion Bag Lebanese Medium | 1.375 |
| Corn Cork Kuwait | 0.630 |
| Kuwait Jumbo Tomatoes | 1.440 |
| Chili Pepper Cork Kuwait | 0.600 |
| Sweet Pepper Colored Saudi | 0.770 |
| Eggplant Saudi | 0.550 |
| Small Indian green pepper | 1.100 |
| Big Saudi Cork Potato | 1.210 |
| Lemon Saudi Medium | 0.770 |

Co-ops Fresh Produce Prices

| Produce | Price |
|-----------------------------|-------|
| Lemon Syria Medium | 0.550 |
| White onion Saudi | 0.595 |
| Jordan Tomatoes 3KG | 1.100 |
| Vietnamese Green Lemon | 0.660 |
| Garlic Chinese Bag | 0.880 |
| Lebanese garlic | 1.100 |
| Pakistani Shawal Potato Bag | 1.375 |
| Potato Kilo | 0.330 |
| Onion kilo | 0.275 |
| Jordanian pepper | 0.495 |
| Broccoli Egyptian Cartoon | 0.550 |
| Large parsley | 0.110 |
| Big Mint | 0.110 |
| Large coriander | 0.110 |
| Large spinach | 0.440 |
| Small Basil | 0.050 |
| Small Celery | 0.050 |
| Spring onions | 0.110 |

Appendix

Co-ops Fresh Produce Prices

| Produce | Price |
|--------------------------------|-------|
| Jordanian Couscous Carton | 0.990 |
| Jordanian colored sweet pepper | 0.880 |
| Lebanese Onion | 0.660 |
| Jordanian chili | 0.660 |
| Indian green pumpkin kilo | 1.100 |
| Round Indian Pumpkin Kilo | 1.100 |
| Egyptian red chili pepper | 1.100 |
| South African Lemon | 0.495 |
| Egyptian lemon | 0.350 |
| Vietnamese Green Lemon | 0.660 |
| Egyptian potatoes kilo | 0.385 |
| American sweet potatoes | 1.375 |
| Spanish white onion Kilo | 0.550 |
| Sweet Pepper Colored Saudi | 0.770 |
| Kuwaiti Arabic lettuce | 0.100 |
| Iranian Shawal Onion 2 kg | 0.495 |
| Iranian Jumbo Onion Bag | 1.716 |
| Kuwaiti Cabbage | 0.200 |

Poixel

Poixel is a branding & marketing creative studio specialize in empowering the market with creative visuals & strategies that can attract the market demand, by building a credible portfolio based on extensive market research & data analysis, aiming to evolve a successful brand growth strategy towards a great relationship with ambitious people.

Build credible data to support your business strategy. Get in touch with us at www.poixel.com

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