# OPPORTUNITY PROFILE

# ON

# SWEET CORN

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**TABLE OF CONTENT**

Pages

## EXECUTIVE SUMMARY

- There is an excellent market for sweet corn in Jamaica as evidenced by the growing demand for the crop.
- The current assumed profitability margin for sweet corn is approximately 240%.
- St. Catherine accounted for 76% of the sweet corn production in Jamaica during the period 2016 -2020.
- The ideal planting season for sweet corn in Jamaica is October-May as there is a decreased likelihood of pest infestation when compared to the summer period.
- Local production is less than the local market demand. Consequently, there is a high volume of importation for the commodity.
- Land unavailability is a challenge faced by some farmers.
- Sweet corn local production increased by 1440% for the period 2016 -2019. Local production however decreased by 35% in 2020.
- There is limited research material available about sweet corn production in Jamaica.
- Tesoro F-1 is the most popular variety grown in Jamaica.
- Imagination Farms is the largest producer of sweet corn in Jamaica.

## CROP PROFILE

Sweet corn (Zea mays saccharata var rugosa) popularly referred to as ‘corn’ by Jamaicans is a variety of the maize group. The crop is perfect for planting in a tropical climate. According to G.Swapna et al “sweet corn is a hybridized variety of maize specifically bred to increase the sugar content.”

A survey conducted with local farmers and agronomist shows that planting sweet corn is labour intensive and requires constant monitoring. Local agronomist Nicheal Dadzi, a participant in the survey notes that, “sweet corn is mainly affected by the corn ear worms and the fall army worms; their invasion in turn affects the quality and yield of the sweet corns. Mr. Dadzie is therefore of the opinion that in Jamaica, the ideal time for planting sweet corn is during the period October to May. His experience in the fields has taught him planting in the cooler climate is more economical as during the summer season the plants suffer from drought conditions as well as a greater infestation of pest.

There are hundreds of varieties of sweet corn; however the data on the variety of sweet corn grown locally is limited. According to the survey participants indicated that the following are the most popular varieties planted in Jamaica.

- Tesoro F-1
- Sugar Princess
- Bright Jean 2
- Golden Sweeter-93
- Amsa Jumbo Sweet
- El Dorado F-1
- Silver King Corn
- Golden Bantam

During the survey Mr. Dadzie emphasized the importance of plant nutrients. He stated that the plant required both primary and secondary nutrients which supports its growth and enables greater yield. The chief nutrients required by the plant are nitrogen,

potassium and phosphorus. Secondary nutrients include magnesium, calcium, zinc and sulphur. These nutrients play an integral role in the germination and formation of the plant until the plant reaches its maturity.

**PLANTING**

Sweet corn is planted using the process of direct seeding or transplanting.

Direct seeding is the process by which the seeds are directly planted into the field. Although this process is labeled as being more economical it can be riskier and requires the treatment of seeds before planting. It is recommended that two seeds are planted per space.

Transplanting is the process by which seeds are sown in garden seed trays (covered in germination mix) and placed in a nursery where growing conditions are controlled. The seedling is then transplanted into the field approximately 10-12 days after germination. This method is considered more expensive in labour due to the additional processes required before the seedling is planted into the soil.

Below are pertinent facts about planting sweet corn:

- Sweet corn is wind pollinated therefore it is recommended that a planting distance of 4-5 ft. apart be used.
- The tassel produces the pollen which fertilizes the silk. The pollen is transferred from the tassel to the silk by the wind. This process is integral for the development of the kernel.
- A silk represents a corn kernel.
- The silk is also an indicator the corn is 18 -21 days away from maturity.
- Sweet corn usually takes 75- 80 days to mature. The crop must be harvested within 3-7 days after maturity. Failure to harvest during this timeframe may result in spoilage due to the corns losing its sugar content and/or getting hard.

## HEALTH BENEFITS

According to G.Swapna et al outlined in Sweet Corn- A Future Healthy Human Food - health benefits of the vegetable include the following:

- Sweet corn is rich in fiber and low in cholesterol. This helps to prevent heart diseases and lowers the risk of atherosclerosis.
- It supplies the body with Vitamin A, B and C and other essential minerals. These key nutrients support the body's metabolism as well as digestive, and nervous systems.
- Sweet corn contains lutein which supports eye health.
- Sweet corn can improve energy levels and performance compared to other vegetables.
- Studies have revealed sweet corn contains ferulic acid which helps to lower the risk of cancer, diabetes, and neurodegenerative diseases.
- Sweet corn is a great provider of iron, which is necessary for the formulation of red blood cells. This helps with the prevention of diseases such as anemia.

## USES

Sweet corn has become a favourite household staple for many families. In Jamaica it is popularly served boiled. It is also enjoyable when grilled and coated in melted butter. Due to the sweet content, it is used creatively as a booster ingredient when served with milk as a breakfast cereal. Additionally, it can be combined with protein meats for delicious main course meals. It can be used as a topping for salads or even sautéed with other vegetables. Using sweet corn is left up to an individual's needs and creativity in the kitchen.

## NATIONAL PRODUCTION OF SWEET CORN

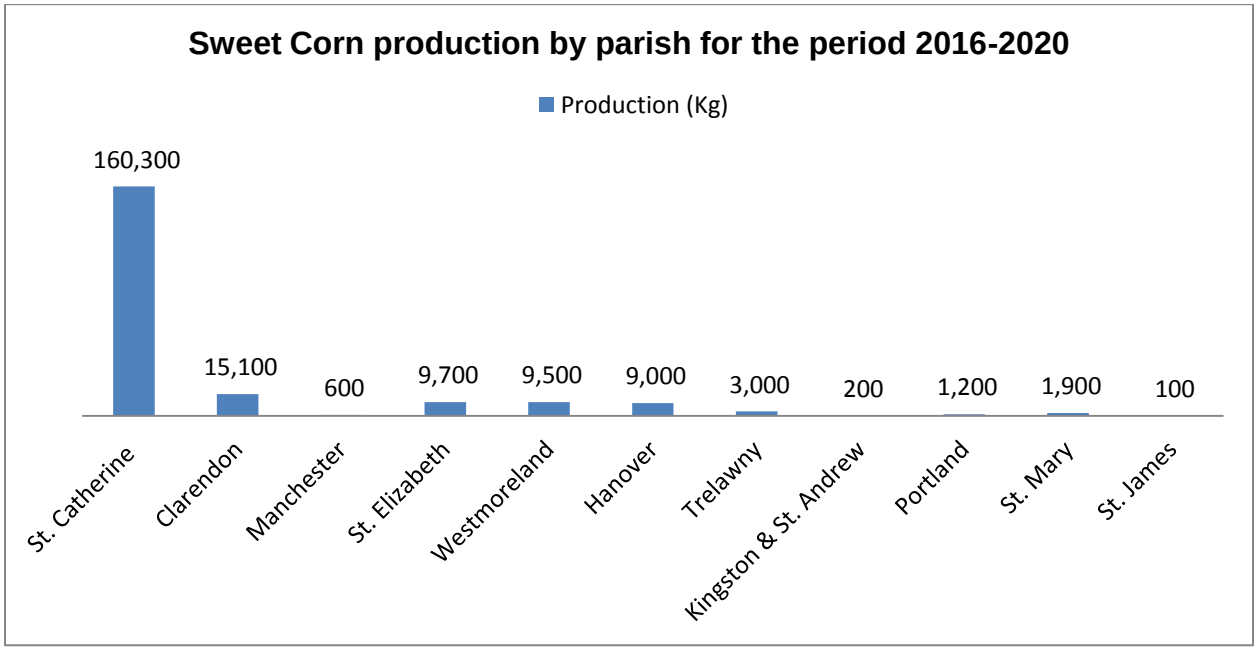



*Figure 1 showing production for the period 2016-2020. Source: MOAF, Agricultural Marketing Information Division (AMID)*

The figures above highlight the distribution of sweet corn production in Jamaica. For the period 2016 - 2020 the country produced a total of 210,600kgs of sweet corn. St. Catherine accounted for 76% of the sweet corn produced. At present, sweet corn is predominantly produced in St. Catherine, Clarendon, Hanover, St. Elizabeth, Westmoreland, and Trelawny.

## ESTIMATES OF SWEET CORN YIELD FOR THE PERIOD (2016-2020) IN JAMAICA

| YEAR | PRODUCTION (Kgs) | AREA REAPED (Hectares) | Yield Per Hectare (Kgs) |
|---|---|---|---|
| **2016** | 5,000 | 4 | 1,250 |
| **2017** | 32,000 | 22 | 1,454.5 |
| **2018** | 41,000 | 31 | 1,322.6 |
| **2019** | 77,000 | 43 | 1,790.7 |
| **2020** | 57,000 | 47 | 1,212.8 |

***Table 1 showing estimates of yield for the period 2016-2020. Source: MOAF, Agricultural Marketing Information Division (AMID)***

An average of 42,400kgs of sweet corns was produced over the period 2016 -2020. The average yield rate per hectare was 1,406kgs. The year 2016 had the lowest production of sweet corn with only 5,000kgs being reaped and a yield of 1,250kgs per hectare. There was a constant growth in production for the period 2016 – 2019, the yield however fluctuated for the period. For the year 2020, the yield amounted to 1,212.8kgs per hectare with a production of 57,000kgs. It is theorized that due to the downturn of the hospitality industry in 2020 (as a result of the COVID-19 pandemic), local farmers scaled-down their sweet corn production because of the reduction in demand by the hotel sector.

## SURVEY FINDINGS

During the period May 25, 2021 – June 9, 2021 a survey was conducted with 17 sweet corn farmers, this included a local agronomist and director of the Imagination Farms. The following is a synopsis of the questions asked and survey findings.

1. ***Which variety of sweet corn do you produce?***

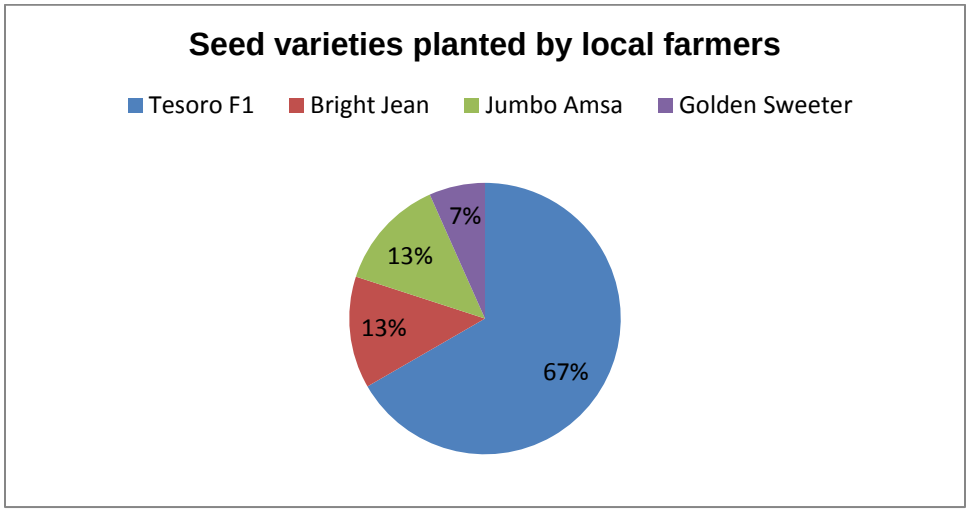



Figure 2 showing varieties of sweet corn planted by farmers. Source: Survey

Figure 2 above shows the distribution of sweet corn seed varieties among local farmers. Tesoro F-1 is the most popular variety planted by local farmers. Other varieties used include bright jean 2, jumbo amsa and the golden sweeter.

2. ***Do you need help marketing your sweet corn?***

Eighty percent (80%) of the farmers who participated in this survey stated they did not need any marketing assistance since the demand for sweet corn was greater than what they were able to supply. Conversely, the remaining respondents stated they were open to access new markets spaces.

3. ***What storage arrangement do you have in place for your harvested sweet corn?***

At present, the local farmers who participated in the survey have not implemented any formal storage arrangement for their sweet corn. Instead they have opted to harvest and sell immediately to local supermarkets, vendors and households for consumption.

4. ***Please indicate your regular market outlets for sweet corn***

Ninety three percent (93%) of the farmers indicated that they sold their sweet corn to vendors. Those who did not supply vendors sold their sweet corn to local supermarkets and households.

5. ***Where do you obtain planting materials for sweet corn?***

The survey participants indicated that seeds, fertilizers and other planting materials are acquired from the following outlets:

- H & L Agro
- Carib Agro
- AG Chem
- Newport – Fersan
- Hardware & Lumber
- Agro-Grace

6. ***What are some of the challenges you encounter in the production of sweet corn?***

The survey conducted revealed that the main challenges faced by sweet corn farmers include:

- *Pest management and control*- Fifty-three percent (53%) of the respondents noted the quality and yield of their sweet corn was affected by worms. Additionally, farmers are finding it challenging to develop proper pest management strategy due to the cost associated.
- *Labour Force*- all the farmers who participated in the survey stated that sweet corn production is highly labour intensive. Thirteen percent (13%) revealed there was unwillingness among some labourers to put in the work required.
- *Irrigation*- Thirty-three percent (33%) of the respondents stated that due to the expensive nature of setting up a good irrigation system, they sometimes lose the crop due to lack of water supply and/or poor water quality.
- *Availability of Land*- Twenty percent (20%) of respondents revealed that the unavailability of fertile farming land has hindered the productivity of the farmers.
- All the respondents stated the cost of production is expensive compared to other vegetables.

7. ***What price range do you sell your sweet corn?***

Thirteen percent (13%) of the farmers stated their selling price ranged from five – six hundred dollars per dozen depending on the size of the sweet corns. One farmer stated his price fluctuated but was always below one thousand dollar per dozen. Eighty one percent (81%) of the farmers stated their selling price ranged from eight – twelve hundred dollars per dozen.

***8. What assistance do you require from the Ministry of Agriculture and Fisheries?***

The farmers stated the following as assistance they would require from the Ministry:

- Administer **more land space for farmers**- Nineteen percent (19%) of the respondents stated the availability of more farming land space would assist with the expansion of their business.
- **Planting materials and equipment**- Fifty six percent (56%) of the respondents noted assistance from the Ministry with planting materials would reduce their cost of production.
- **Cold storage facilities**- Nineteen percent (19%) of the respondents requested assistance with the establishment of cold storage facilities to store their sweet corns.
- Six percent (6%) of the respondents stated they did not require any assistance from the Ministry of Agriculture and Fisheries.
- **Sensitization sessions**- One respondent stated they would appreciate educational training from the Ministry on the different soil types and proper planting techniques that would enable them to improve the quality of their sweet corn.
- **Marketing**- One respondent stated he had difficulties getting sales for his sweet corn and needed assistance marketing his crop.
- **Expansion of loan options for farmers**- One respondent stated the Ministry of Agriculture and Fisheries could lobby for more loan options for farmers to assist with expansion.

## AN OVERVIEW OF IMAGINATION FARMS SWEET CORN PRODUCTION

Imagination Farms, a subsidiary of the Caribbean Broiler's Group is currently Jamaica's largest producer of sweet corn. The company has undertaken the task of increasing local production of sweet corn by planting an acre of the commodity weekly. The company currently has approximately 20 acres of sweet corn under production which is achieved through the process of transplanting. El-Dorado F-1, Golden Sweeter and Bright Jean 2 are varieties planted by this company. The corns usually take 75-80 days to mature after which it is harvested and stored in a cold room owned by the company. The company mainly supplies sweet corn to supermarkets and retail outlets in Kingston and St. Catherine. Additionally, the company contracts local farmers to plant the commodity and assist them in getting the planting materials required. The aim of this initiative is to provide low-cost sweet corn for Jamaican citizens and reduce the volume of importation of the commodity. Although operations for the company have been fruitful, Imagination Farms production is sometimes hindered due to the stringent process of importing quality seeds. Data was obtained through survey with Mr. Don McGlashan (operations manager).


The images above depict the front and back of the package used by Imagination Farms to market its sweet corn in local supermarkets**.**

## OVERVIEW OF SWEET CORN IMPORTS IN JAMAICA

Presently, local producers are unable to meet local demand for sweet corn. As a result, there is a high importation volume of sweet corn in Jamaica. Below is a table outlining import data for sweet corn for the period 2016 - 2020:

| Year | Weight (Kgs) | J$CIF | US$CIF |
|---|---|---|---|
| **2016** | 1,134,961 | $163,866,103 | $1,312,286 |
| **2017** | 1,257,429 | $155,206,498 | $1,212,075 |
| **2018** | 1,402,307 | $158,136,718 | $1,223,996 |
| **2019** | 1,321,204 | $240,016,074 | $1,801,375 |
| **2020** | 2,916,471 | $302,451,375 | $2,125,277 |

**Table 2 shows Jamaica's sweet corn imports for 2016-2020. Source: STATIN**

There was a total of 8,032,372kgs of sweet corn imported in Jamaica for the period 2016-2020. The country imported the lowest volume of sweet corn in the year 2016 (1,134,961kgs). Importation in 2020 (2,916,471kgs) was doubled compared to the previous years.

## GLOBAL OVERVIEW

Sweet corn is in the top three (3) most produced grains in the world. The United States of America is the world's largest producer and exporter of sweet corn. For the period 2017- 2019 the country harvested an average of 443, 000 acres of sweet corn. Due to its nutritional value, consumption of sweet corn has been increasing consistently on a global scale. Sweet corn is globally traded frozen or prepared/preserved.

## EXPORTERS

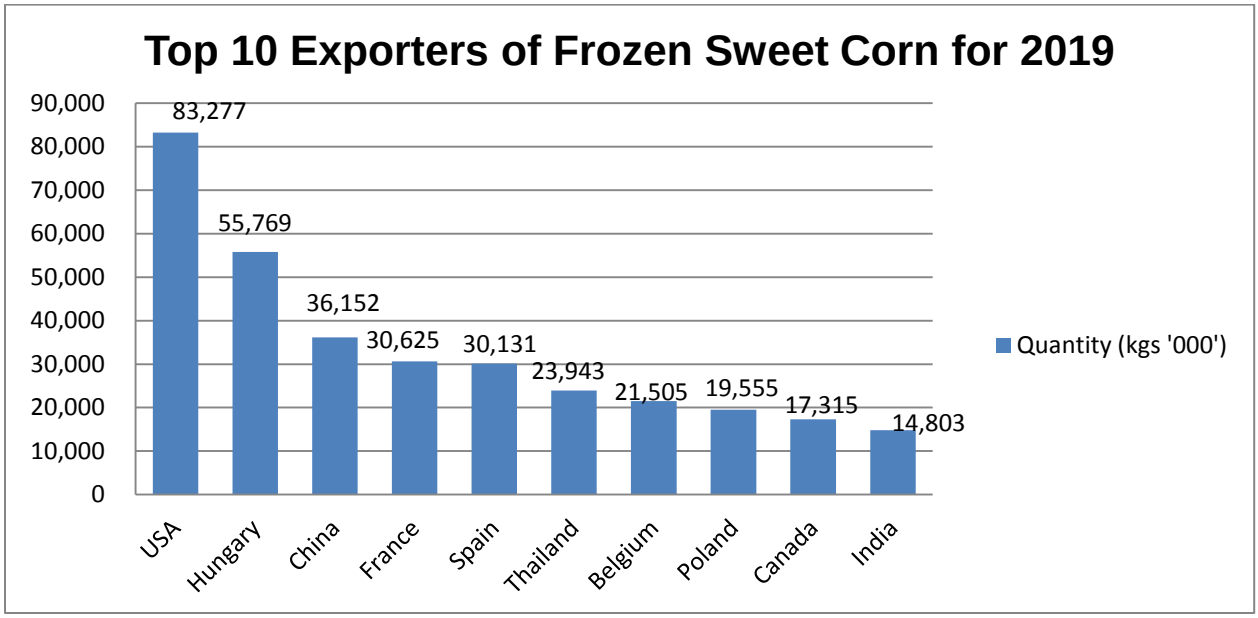



**Figure 3a shows the top 10 exporters of frozen sweet corn for 2019 Source: FAOSTAT.**

Figure 3a above shows that the United States is the largest exporters of frozen sweet corn. In 2019 the country exported 83,277,000kgs of the commodity.

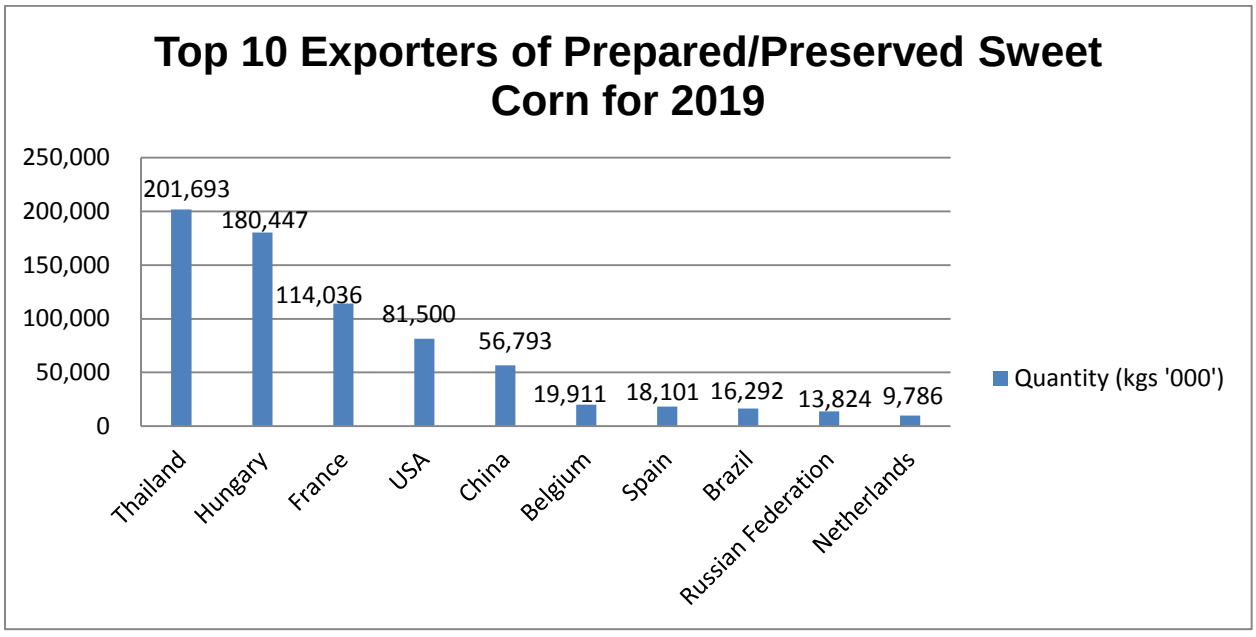



**Figure 3b shows the top 10 exporters of prep or preserved sweet corn for 2019 Source: FAOSTAT.**

Figure 3b above shows that Thailand is the top exporter of prepared or preserved sweet corn. The country exported 201,693,000kgs of preserved/prepared sweet corn in 2019.

## IMPORTERS

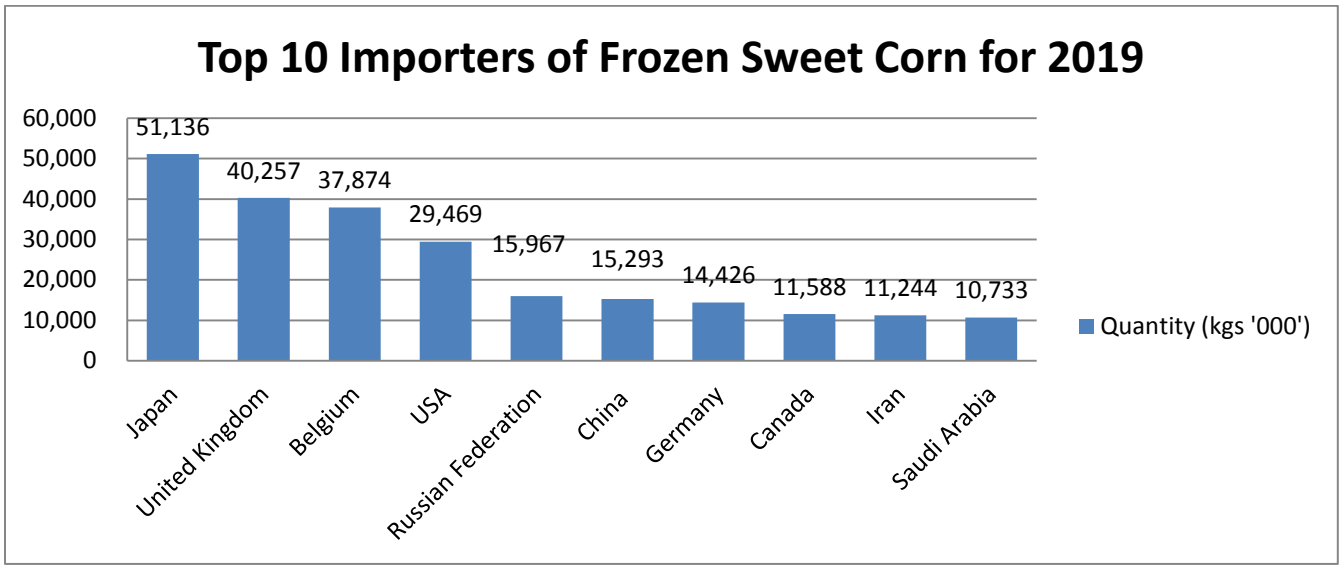



**Figure 3c shows the top 10 importers of frozen sweet corn for 2019 Source: FAOSTAT.**

Figure 3c above identifies Japan as the top importer of frozen sweet corn in 2019. The country imported 51,136,000kgs.

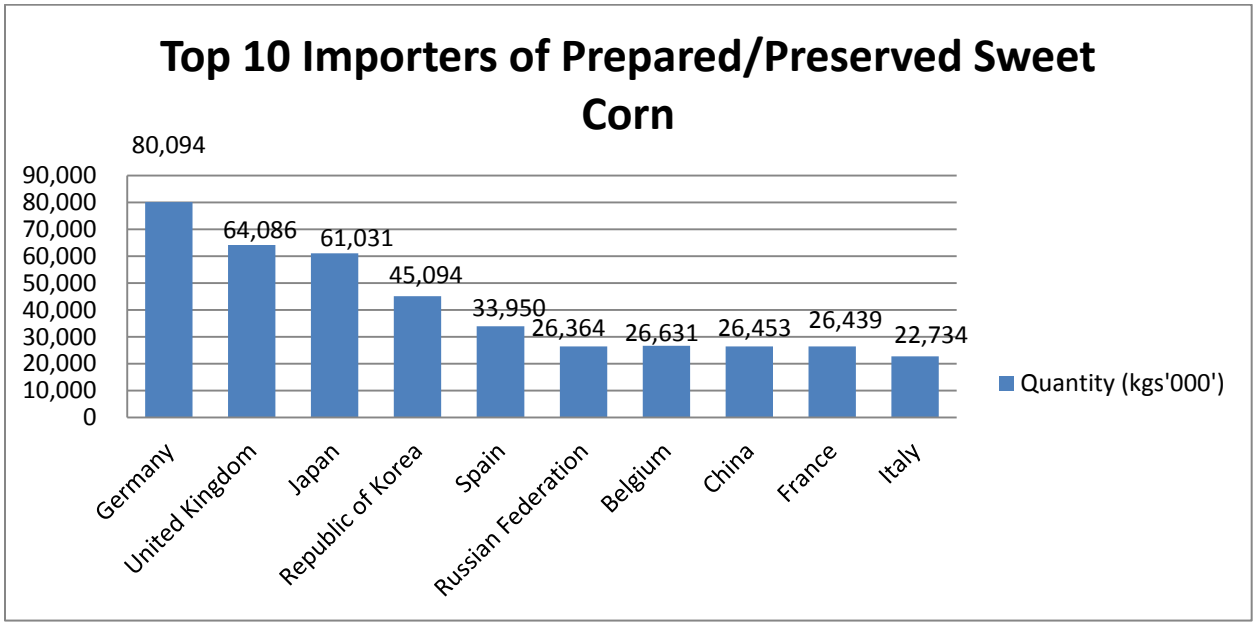
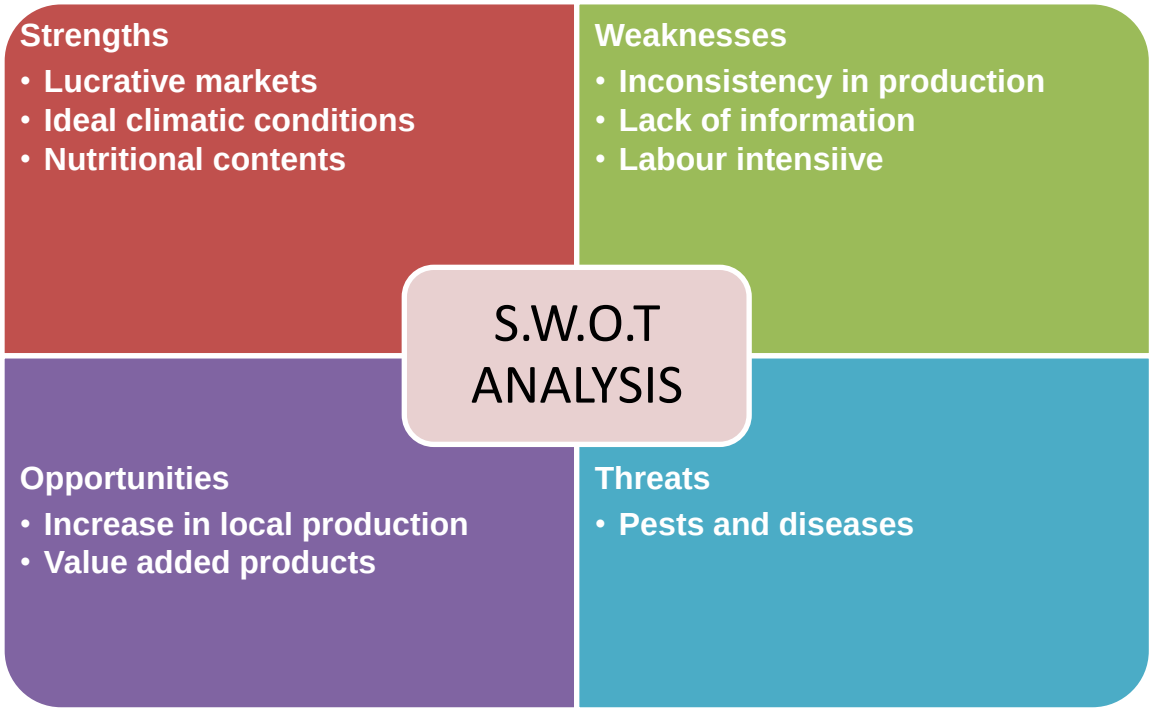



**Figure 3d shows the top 10 importers of prep or preserved sweet corn for 2019 Source: FAOSTAT.**

Figure 3d above reveals Germany was the top importer of prepared or preserved sweet corn. The country imported 80,094,000kgs for the period.

**SWOT ANALYSIS**




The Main Strengths of Sweet Corn:

- Lucrative market- The demand for sweet corn by Jamaicans continues to grow annually and the profit margin for the commodity is high as stated above.
- Ideal Climatic Condition- Jamaica's climate is ideal for growing sweet corn.
- Nutritional Content- the health benefits of sweet corn are numerous, ranging from being high in fiber to being a good source of protein.

The Main Weaknesses of Sweet Corn:

- Inconsistency in Production- although there has been an increase in the volume of sweet corn production, the amount produced has been fluctuating.
- Lack of Information on Corn Seeds- there is little information on sweet corn varieties which is more suitable for growth in the Jamaican climate.
- Labour intensive- the crop requires careful management to ensure its growth is not hindered.

The Opportunities of Sweet Corn:

- An increase in local production could limit the dependence on imports, thereby reducing the food import bill. This could create more market partnership for local farmers and agro-processors to produce at a lower rate.
- Value Added Products- local sweet corn production is currently being sold as fresh produce by local farmers. The option to explore sweet corn as a value added ingredient for products such as salsa, mixed vegetables, cereal etc., would not only expand local market share but also open opportunities for export markets.

The Threats of Sweet Corn:

- Pest and Diseases- sweet corn is mainly affected by smut, worms and diseases. These affect the quality of the corns produced.

## CAME ANALYSIS

In order to **correct** our weakness:

- The Ministry of Agriculture and Fisheries, through its research arm should conduct research on the seed varieties to determine which is more compatible to the Jamaican conditions and will provide greater yields for farmers.
- It is recommended that sensitization sessions be held with our local farmers to incentivize and build capacity in the production of the crop.

**Adapting** to the threats can be achieved through:

- Collaboration between the Ministry of Agriculture and Fisheries and the Rural Agricultural Development Authority to develop pest management strategies to assist local farmers who are having challenges with pests and diseases.

The strengths can be **maintained** by:

- Developing grades and standards for sweet corn to ensure that the quality sold to consumers is consistent.

Opportunities to be **explored** include:

- New markets- sweet corn is currently marketed as fresh produce in Jamaica. Exploring the value added potential of the crop could create new international and local markets.

## STANDARDS OF QUALITY

There are no international standards set out by the Codex Alimentarius for sweet corn, hence the standards set out by the United States Department of Agriculture were incorporated.

| Characteristics | U.S Fancy | U.S No. 1 | U.S No. 2 |
|---|---|---|---|
| Size | 152.4mm(>6 inches) | 127mm (>5 inches) | 101.6mm (>4 inches) |
| Colour | Uniform colour, typical of the variety. | Uniform colour, typical of the variety. | Uniform colour, typical of the variety. |
| Shape | Uniform | Uniform | Uniform |
| Appearance | Well-trimmed, filled and developed; free from decay, smut, worms, and diseases. | Well-trimmed and developed; fairly filled, free from smut, decay, and rust. Free from discoloration, diseases, worms, and other insects. | Fairly well-trimmed, filled and developed. Free from smut and decay. Free from serious damage caused by worms, diseases, birds, and other insects. |

**Table 5 highlights quality standards set out by the USDA for sweet corn. Source: USDA United States Department of Agriculture**

## STORAGE

Although there is no storage standard set out by the Food and Agriculture Organization (FAO) for sweet corn, it is recommended that the crop is stored in a cool environment ranging from approximately $30^{o}F$ – $35^{o}F$ for no more than a week. This is done to maintain the sugar content of the crop and prevent it from getting hard consequence of its short shelf-life.

## PROFITABILITY

| YEAR | COST OF PRODUCTION (per dozen) | Farmgate Price (per dozen) | % Profitability |
|---|---|---|---|
| 2021 | $334 | $800 | 240% |

**Table 6 shows a preliminary costing for sweet corn. Source: Economic Planning Division MOAF.**

Table 6 above shows that the production of sweet corn has an approximate profit margin of 240%. Note that estimated figures presented by the Economic Planning Division for June 2021 are utilized in the table above.

## MARKET OPPORTUNITIES

There is an excellent market demand for sweet corn in Jamaica and the profit margin of the commodity is relatively favourable. Consequently, it is important to explore the following market opportunities associated with its production:

- An increase in local production could limit the dependence on imports. This could create more market partnerships for local farmers and agro-processors to produce at a lower rate.
- Currently, sweet corn is being marketed as a fresh produce by local producers. A diversification of the crop for value added processing could increase revenue and the competitiveness of Jamaica on the international market.
- Value added markets which can be explored include: canned corns, corn chips, mixed vegetables and cereals since consumption is preferred in this manner.

## RECOMMENDATIONS

- Research should be conducted on the different varieties of sweet corn to determine which adapts better to the Jamaican climate and the best practices for planting including planting time etc.
- A pest and disease control strategy to assist farmers with production during the dry season should be developed.
- Post-Harvest Technologies (e.g. cold storage facilities) to assist farmers with storage should be introduced. This will reduce the economic loss attained due to spoilage.
- Grades and standards for the commodity to prevent exploitation of local producers should be formulated.
- Steps should be taken to sensitize local farmers on sweet corn production and encourage them to get involved in all aspects of the industry.

# APPENDICES

**APPENDIX 1**

**Ministry of Agriculture & Fisheries**
**Sweet Corn Questionnaire**

Name: _____

Contact Number: _____

Gender

1. Male ☐ Female ☐

2. Age group
   18-26 ☐ 27-35 ☐ 36-4 ☐ 45 and over ☐

3. How long have you been involved in the production of sweet corn? _____

4. How many hectares of sweet corn do you currently have under production? _____

5. How many growing cycles do you have per year? _____

6. Which variety of sweet corn do you produce? Why?
   _____
   _____
   _____

7. Where do you obtain planting material for sweet corn?
   _____
   _____
   _____
   _____
   _____

8. What are some of the challenges you encounter in the production of sweet corn?

   _____
   _____
   _____
   _____

9. Please indicate your regular market outlets for sweet corn.
   A. Supermarkets ☐
   B. Vendors ☐
   C. Hotels ☐
   D. Restaurants ☐
   E. Agro-processors ☐

   Others_____

10. Do you need help marketing your sweet corn?

    Yes ☐

    No ☐

    If,"yes,"please specify _____

11. What price range do you sell your sweet corn?
    _____
    _____
    _____
12. What storage arrangement do you have in place for your harvested sweet corn?
    _____
    _____
    _____
13. What assistance do you require from the Ministry of Agriculture and Fisheries?
    _____
    _____
    _____
    _____
    _____

**SURVEY RESPONDENTS**

| Name of Respondents | Telephone Number | Occupation |
|---|---|---|
| Oshane Findley | 876-823-1386 | Local Farmer |
| Lonroy Myles | 876-374-0267 | Local Farmer |
| Roy Atkinson | 876-509-2146 | Local Farmer |
| Paul Salmon | 876-798-9634 | Local Farmer |
| Rueben Osbourne | 876-412-2833 | Local Farmer |
| Latoya Rattray | 876-815-3067 | Local Farmer |
| Wesley Chambers | 876-449-6809 | Local Farmer |
| Steando Wright | 876-323-5714 | Local Farmer |
| Chris Wright | 876-572-1747 | Local Farmer |
| Paul Henry | 876-323-3511 | Local Farmer |
| Latoya Green | 876-433-4466 | Local Farmer |
| Lewis Williams | 876-405-8630 | Local Farmer |
| Allan Mitchell | 876-432-8253 | Local Farmer |
| Orlando Waisome | 876-432-3434 | Local Farmer |
| Nichael Dadzie | 876-371-1091 | Agronomist |
| Kinsley Clarke | 876-543-6196 | Local Farmer |
| Don McGlashan | 876-579-6622 | Operations Manager (Imagination Farms) |

**Sweet corn seeds being treated**

**Seedling direct sowing vs. transplanting**

**Direct Sowing**

**Transplanting**

**Corn tassel**

**Wind pollination of silk**

**Mature corn ready for harvest**

**References**

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