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EFFECTS OF VARIETY AND HOLDING TIME ON SOME POST HARVEST QUALITY OF SWEETCORN (*Zea mays* L. *saccharata*)

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ABSTRACT

Sweet corn, an essential vegetable crop in the agriculture industry worldwide due to its high economic and nutritional value, has a short shelf life and deteriorates rapidly after harvesting, leading to loss of quality and nutritional values. An experiment was conducted at the Federal University of Agriculture, Abeokuta (FUNAAB) to determine the impact of time of holding after harvest on the physico-chemical attributes of two varieties of sweet corn at milk stage. Ayo F1 Hybrid and Hybrix 55, with holding time: at harvest (0), 24, 48 and 72 hours after harvest were studied. Treatments were laid out in a Completely Randomized Design replicated three times. Data were taken on proximate composition which included- dry matter, ash, crude fibre, crude protein, carbohydrate and fat. They were determined according to methods described by the Association of Official Analytic Chemists. Total soluble solids (TSS), total sugar, starch contents and colour were also determined. Hybrix 55 variety had higher dry matter, fat, ash crude fibre, crude protein, TSS, total sugar and starch contents relative to Ayo F1 Hybrid variety which had higher moisture content. The b* value (yellowness) in Hybrix 55 was also higher when compared with Ayo F1 variety of sweet corn. The L* colour value (lightness) increased maximum at 72 hours after harvest. Starch, crude protein, crude fibre, fat and ash contents increased significantly at 72 hours after harvest. The TSS and total sugar reduced with holding time. Higher values were obtained at harvest and least at 72 hours after harvest. Hybrix 55 variety held for 72 hours after harvest had the highest fat, ash and crude fiber contents. Hybrix 55 variety of sweet corn variety was sweeter with brighter colour and maintained its nutritional content at harvest.

Keywords: Sweet corn; storage; nutritional values; physical attributes; variety

INTRODUCTION

Sweet corn (*Zea mays* L. saccharata) is a highly valued crop worldwide, cultivated for its tender kernels consumed as a vegetable, and it is increasingly recognized for its nutritional value and adaptability to various agro-climatic conditions (Sidahmed *et al.,* 2025). Production is usually targeted at three distinct and largely independent markets: fresh, canning and freezing, with the fresh market component accounting for more than 70% of the total demand (Lizaso *et al.*, 2007). Sweet corn plays an important role in the human diet because of its health-promoting nutritional characteristics. It is rich in carbohydrates and sugars and contains useful amounts of vitamins A, C and B3, which supports metabolism, the nervous and digestive systems (Swapna *et al.*, 2020).

One of the defining features of sweet corn is its high sugar content, which contributes significantly to its sweetness (Sidahmed *et al.,* 2025). The sugars in sweet corn are primarily sucrose, glucose, and fructose, with sucrose being the dominant sugar that gives the crop its characteristic sweet flavor. The concentration of sugars in sweet corn is highly variable and is influenced by both genetic factors and post-harvest conditions. During growth, sugar accumulation is primarily influenced by environmental factors such as temperature, soil fertility, and water availability, with cooler temperatures (15 - 18^{0}C) often leading to higher sugar concentrations (Sidahmed *et al.,* 2025). The rate of sugar conversion to starch after harvest significantly impacts flavor and sweetness, with sweeter varieties retaining more sugar in the kernels post-harvest (Duvick, and O'Rourke, 2019).

In Nigeria, maize is grown throughout the country from the high rainfall forest of the southeast to the low rainfall Sudan savanna of the north. With supplemental irrigation, maize can be grown throughout the year. Nigeria produces about 40% of the maize production in West and Central Africa (FAO, 2016). Great potential therefore exists to produce sweet corn in Nigeria.

Sweet corn harvested at the milking stage is prepared and eaten as a vegetable, rather than a grain, unlike other maize varieties which are harvested at seed physiological maturity. Harvesting at the milk stage of maturity represents a crucial stage in development where the kernels are fully formed but still milky (Lizaso *et al.*, 2007). The genetic make-up of the sweet corn varieties plays an important role in determining their quality at harvest. Different varieties have been bred for specific traits such as sweetness, colour and nutritional content. High sugar varieties also exhibit increased levels of certain antioxidants, contributing to their nutritional value (Azanza *et al.*, 2008). Yellow variety of sweet corn is typically higher in carotenoids such as lutein and zeaxanthin which are beneficial to the eye while white varieties are preferred for their tenderness and delicate flavor (Azanza *et al.,* 2008).

Holding time, which is the duration between harvest and consumption or processing, is a critical factor affecting the quality of sweet corn. Immediately after harvest, sweet corn begins to lose its sugar content as it is converted into starch. This conversion is part of the natural aging process of the corn, and it can significantly impact the taste and texture if the corn is not consumed or processed quickly (Davis and Green, 2018). Clark (2019) stated that within hours post-harvest, sweet corn can lose a substantial amount of its sugar content, leading to a decrease in sweetness and an increase in toughness. However, proper storage conditions can mitigate some of the adverse effects of holding time. Refrigeration can slow down the conversion of sugar to starch, thereby preserving the quality of the corn for a longer period (Lee *et al.,* 2021). Even under optimal storage conditions, the quality of sweet corn inevitably deteriorates over time, making it essential to minimize holding time to maintain its desirable qualities (Wong and Liu, 2017). Post-harvest handling conditions significantly influence the physico-chemical composition and overall quality of sweet corn. Understanding these effects is essential for maintaining the nutritional value, flavour and texture of sweet corn for consumers. This study was therefore conducted, to determine some physical and chemical composition of Ayo F1 and Hybrix 55 varieties of sweet corn held for different times after harvest.

MATERIALS AND METHODS

Experimental site

The experiment was conducted at the Laboratory of the Department of Horticulture, Federal University of Agriculture, Abeokuta between February and March, 2025

Field management and source of plant materials

Sweet corn was sourced from Agricwas Farm, Aboke village, Ibadan, Lagelu Local Government Oyo State Nigeria (Longitude 4° 46'E and Latitude 7° 28'N). Two varieties of sweet corn: Ayo F1 Hybrid and Hybrix 55 were cultivated. The field was ploughed, harrowed and mulched with mulching film to prevent frequent weeding. The sweet corn seeds were sown into cocoa peat that was thoroughly washed and soaked in water, placed in a plastic tray at the nursery. The seedlings were adequately irrigated and fertigated with Urea. Ten days after planting, the seedlings were transplanted unto the main field at a sowing depth of 50-60 cm at a spacing of 70 cm between rows and 30 cm within rows.100 kg N/ha of NPK 15:15:15 was applied in three splits (Odeyemi *et al.,* 2024). The first dose was applied immediately after transplanting into the field at three weeks and the remaining half dose applied in two equal splits at four and six weeks after transplanting. The field was irrigated, and insects were controlled with the use of Lancer®750DF (active ingredient: Acephate).

Sample collection

Sweet corn was harvested 65 days after planting at the milk stage. Harvesting was done in the early morning to reduce field heat and reduce the rate of deterioration and ensure good quality of sweet corn kernels. Harvested cobs were placed in a plastic crate and transported in coolers to the Department of Horticulture Laboratory, Federal University of Agriculture, Abeokuta. The harvested cobs were held at 0, 24, 48 and 72 hours after harvest at ambient temperature harvest before subjected to qualitative analysis. Data were collected on the following parameters.

Total Soluble Sugar (TSS): This was determined as readings of juice from fresh samples on the surface of a hand-held Brix Refractometer (Model Atago 1140, Japan).

Moisture content: Measured using air-oven, following methods of Association of Official Analytical Chemists (AOAC, 2003). A material test chamber M720 (Labotec, South Africa) was used to dry an empty weighing vessel at 105 °C for 1 h (W_1) and weighed (W_2). The dry sample (5 g) was thereafter poured into the vessel, oven dried at 105 ± 1 °C until constant weight was attained. This was then cooled in a desiccator, after which it was weighed (W_3). The percentage moisture was calculated as:

$$\% \text{ Moisture content} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

Where W1 = weight of the empty vessel. W2 = weight of the vessel + sample. W3 = weight of vessel + dried sample.

Dry matter content: 100 - moisture content.

Fat content: Determined using Soxhlet extraction techniques (AOAC, 2005)

Ash content: Determined using dry ashing method (Agrilasa, 2007). A porcelain crucible was dried at 105 °C for 1 h, after cooling in a desiccator, and then weighed (W1). The samples (2 g) were placed in the previously weighed crucible and reweighed (W2).The crucible with its content was then ashed first at 250 °C for 1 h at 550 °C for 5 h. (Furnace

E-Range, E300-P4, MET-U-ED South Africa) and allowed to cool and the weight was taken (W3). The percentage ash was calculated as:

$$\%\text{Ash content} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

Where W1 = weight of a dried porcelain crucible. W2= weight of the crucible + sample. W3= weight of the crucible + ashed sample.

Crude Fibre: A modification of the acid/base digestion method described by Aina et al. (2012) was used to determine the dietary fibre. A 5 g of sample was digested with 100 mL of 0.25 M sulfuric acid solution by boiling under reflux for 30 min and quickly filtered. The insoluble matter was rinsed four times with boiling water to remove the remaining acid. This process was repeated on the residue using 100 mL of 0.31 M sodium hydroxide solution. The final residue was washed with water until it was free of base. It was then oven-dried at 100 °C, cooled in a desiccator and weighed (C1). The weighed sample was incinerated in a muffle furnace at 550°C for 5 h, transferred to cool in a desiccator and weighed (C2). The percentage crude fibre was calculated as:

$$\%\text{ Crude fibre} = \frac{C2 - C1 \times 100}{\text{Weight of sample}}$$

Crude Protein: The total nitrogen amount in the sample was determined following the micro kjedahl method (AOAC, 2005).

Total Carbohydrate: Estimated by deducting the total crude protein, crude fibre, ash and lipid from the total dry matter as: %Total carbohydrate = 100 – (% Moisture content + % Total Ash + % crude fat + % crude fibre +% crude protein). Total soluble solid was measured with the use of Digital Refractometer (Model GY-1, capacity 15 x 10^5pa)

Total Sugar: 0.2 g of sweet corn flour sample was weighed into a centrifuge tube, 1 ml of 100% ethanol, 2 ml of distilled water and 10 ml of hot ethanol was added. The mixture was vortexed and centrifuge for 10 mins at 200 rpm. The supernatant (sugar portion) was pipetted into a test tube, 9.8 ml of the distilled water, 0.5 ml of phenol and 2.5 ml of concentrated H_2SO_4 was added and vortexed. The absorbance was read in a spectrophotometer at 490nm wave length.

$$\%\text{Sugar} = \frac{\text{absorbance} - \text{intercept x dilution factor x volume}}{\text{Weight of the sample x slope x 10,000}}$$

Total Starch: 7.5 perchloric acid was determined by adding to the sediment and it was allowed to stand for 1hr, 17.5ml of distilled water was added to it and vortexed. 0.5 ml of the solution was pipette into a test tube, 0.95 ml of distilled water, 0.5 ml of phenol and 25 ml of H_2SO_4 was added and vortexed, allowed to cool down then the absorbance was read at 490 nm in a spectrophotometer.

$$\%\text{TotalStarch} = \frac{\text{Absorbance} - \text{intercept x dilutionfactor xvolume x0.9}}{\text{Weight of sample x slope x 10,000}}$$

Colour: This was determined with the use of colorimeter (Konica Minolta R, model CR-400/410, Netherlands) to measure colour coordinates in hunter's L*, a* and b* units. The L* represents the lightness (0 -100), black to white), a* indicates the redness (+a*) or greenness (-a*), and b* indicates the yellow (+b*) or blue (-b*) of the sweet corn kernel.

Statistical analysis

Data were subjected to analysis of variance using R Statistical Software (R Core Team, 2024) and significantly different means were separated using least significant difference (LSD) at 5% level of probability.

RESULTS AND DISCUSSION

Proximate composition of sweet corn kernel as influenced by variety

Hybrix 55 variety had higher dry matter, fat, ash, crude fiber, crude protein and carbohydrate contents relative to Ayo F1 variety. However, moisture content of Ayo F1 sweet corn variety was higher than from Hybrix 55 (Table 1).

Table 1: Proximate composition (%) of sweet corn kernel as influenced by variety

Variety	Moisture	Dry matter	Fat	Ash	Crude fiber	Crude protein	Carbohydrate
	%						
Ayo F1	85.08	14.92	1.12	0.38	1.39	2.15	9.88
Hybrix 55	83.17	16.82	1.30	0.52	1.76	2.43	10.82
LSD (p<0.05)	0.91	0.95	0.05	0.04	0.06	0.07	0.76

Biochemical composition and colour of sweet corn kernel as influenced by variety

Hybrix 55 sweet corn kernels had higher total soluble solid, total sugar and total starch contents relative to Ayo F1 kernels (Table 2). The b* colour value which indicates yellowness from Hybrix 55 variety was higher than from Ayo F1 kernel. The L* and a* colour values in both varieties were similar (Table 3).

Table 2: Biochemical composition of sweet corn kernel as influenced by variety

Variety	Total Soluble Solids (%)	Total Sugar (mmol/L)	Total Starch (g/100g)
Ayo F1	16.88	19.88	22.40
Hybrix 55	18.65	21.39	26.05
LSD (p<0.05)	0.21	0.10	0.12

Table 3: Colour of sweet corn kernel as influenced by variety

Variety	L*	a*	b*
Ayo F1	41.31	0.47	16.58
Hybri**d 55**	41.80	0.72	18.25
LSD (p<0.05)	ns	ns	1.09

Note: L-lightness of the sweet corn kernel (0-100): a –redness (+ve) or greenness (-ve) of sweet corn: b- blueness (-ve) or yellowness (+ve) of sweet corn.

Proximate composition of sweet corn kernel as influenced by holding time after harvest

Moisture content of the sweet corn kernels decreased significantly with holding time; higher values were obtained at 0 hour (at harvest). However, dry matter content increased with holding time; with higher values obtained at 72 hours after harvest. Carbohydrate, fat and ash contents increased with holding time; with significant values obtained at 72 hours after harvest. Crude protein in sweet corn held for 72 hours after harvest was higher than values obtained for sweet corn held for 48 hours. The value was, however, comparable with sweet corn at harvest and those held for 24 hours after harvest (Table 4).

Table 4: Proximate composition (%) of sweet corn kernel as influenced by holding time

Holding time (hours)	Moisture	Dry matter	Fat	Ash content	Crude fibre	Crude protein	Carbohydrate
				%			
0 (at harvest)	84.37	15.63	1.14	0.43	1.53	2.36	10.20
24	82.28	17.41	1.19	0.38	1.49	2.23	11.39
48	78.75	21.24	1.20	0.44	1.55	2.19	13.48
72	77.63	22.36	1.33	0.54	1.75	2.38	12.99
LSD ($p<0.05$)	0.91	0.98	0.88	0.07	0.11	0.18	0.54

Biochemical composition of sweet corn kernel as influenced by holding time after harvest

Total soluble solid and total sugar contents of sweet corn reduced with holding time from harvest (0 hour) to 72 hours after harvest (Table 5). Sweet corn at harvest contained the highest amount of total soluble solid and total sugar. Starch contents of the sweet corn kernel however increased with time of holding after harvest; with least values obtained at harvest and at 24 hours after harvest (Table 5).

Table 5: Biochemical composition of sweet corn kernel as influenced by holding time after harvest

Holding time (hours)	Total soluble solids (%)	Total Sugar (mmol/L)	Total Starch (g/100g)
0	19.30	22.27	23.59
24	18.20	20.98	24.0
48	17.13	19.58	24.45
72	16.50	19.11	24.84
LSD ($p<0.05$)	0.30	0.15	0.12

Colour of sweet corn kernel as influenced by holding time after harvest

The L* value which indicates lightness increased with holding time after harvest. Sweet corn held for 72 hours after harvest under ambient condition had higher L* value when compared with values obtained for sweet corn at harvest and at 24 and 48 hours after harvest. The a* value which indicates redness was comparable at 24 and 72 hours after harvest but higher than values obtained for sweet corn at harvest and at 48 hours after harvest. However, the b* value which indicates yellowness was comparable at harvest and with 24, 48 and 72 hours of holding under ambient condition (Table 6).

Table 6: Colour of sweet corn kernel as influenced by holding time after harvest

Holding time (hours)	L*	a*	b*
0	41.35	0.43	16.87
24	41.10	0.53	16.86
48	40.62	0.46	17.48
72	42.93	0.79	17.91
LSD ($p<0.05$)	0.94	0.27	ns

Note: L-lightness of the sweet corn kernel (0-100), a –redness (+ve) or greenness (-ve) of sweet corn, b- blueness (-ve) or yellowness (+ve) of sweet corn.

Hybrix 55 variety of sweet corn held for 72 hours after harvest had the highest fat, ash and crude fibre contents when compared with other treatment combinations (Table 7). There were no significant differences in the moisture, dry matter, crude protein and carbohydrate content of sweet corn as influenced by variety and holding time after harvest. (Table 7).

Table 7: Proximate composition (%) of sweet corn kernel as influenced by variety and holding time after harvest

Variety	Holding time (hours)	Moisture	Dry matter	Fat	Ash	Crude fibre	Crude protein	Carbohydrate
		%						
Ayo F1	0	85.85	14.73	1.05	0.38	1.39	2.19	9.97
	24	85.21	14.79	1.14	0.35	1.33	2.12	9.83
	48	85.27	14.15	1.04	0.32	1.24	2.02	9.52
	72	83.98	16.02	1.26	0.46	1.58	2.26	10.46
Hybrix 55	0	83.47	16.53	1.22	0.47	1.62	2.52	10.69
	24	83.64	16.36	1.23	0.42	1.65	2.34	10.72
	48	83.18	16.82	1.36	0.55	1.86	2.36	11.46
	72	82.41	17.59	1.40	0.62	1.91	2.50	10.40
LSD ($p<0.05$)		0.45	ns	0.10	0.08	0.13	ns	ns

Biochemical composition and colour of sweet corn kernel as influenced by variety and holding time after harvest

Ayo F1 variety of sweet corn had the least starch content at harvest. Hybrix 55 variety had the highest amount of total soluble sugar and total sugar at harvest when compared with other treatment combinations (Table 8). Highest starch content was observed in Hybrix 55 variety held for 72 hours while the least total soluble sugar and total sugar were obtained from Ayo F1 variety held for 72 hours after harvesting (Table 8). The colour (L, a* and b* values) of Ayo F1 and Hybrix 55 varieties of sweet corn held at 0, 24, 48 and 72 hours after harvest were similar.

Table 8: Biochemical composition of sweet corn kernel as influenced by variety and holding time

Variety	Holding time (hours)	Total Soluble solid (%)	Total Sugar (mmol/L)	Total Starch (g/100 g)
Ayo F1	0	18.40	21.24	21.77
	24	17.17	20.18	22.12
	48	16.30	18.75	22.75
	72	15.67	18.15	22.95
Hybrid **55**	0	20.20	23.30	25.42
	24	19.07	21.77	25.89
	48	18.0	20.42	26.15
	72	17.33	20.07	26.72
LSD ($p<0.05$)		0.75	0.21	0.36

DISCUSSION

Hybrix 55 variety of sweet corn had more dry matter, fat, ash, crude fibre, crude protein and carbohydrate contents which indicated that their handling and storage behavior might differ. However, Ayo F1 variety has higher moisture content and may require careful handling and storage. Delay in harvest may lead to high postharvest loss. Wolf *et al.,* (2021) stated that proper moisture content at harvest plays a crucial role in preserving desirable texture, as sweet corn with too much moisture can be prone to decay, while too little moisture can result in tough, unpalatable kernels. Hybrix 55 sweet corn was sweeter with brighter colour (yellowness) than Ayo F1 sweet corn variety. Differences in attributes of sweet corn due to variety had been earlier observed. Odeyemi *et al.*, (2024) in an experiment on two varieties of sweet corn, was reported that Sugar F1 was sweeter than Royal Hybrid variety of sweet corn. Breeding efforts have focused on developing sweet corn hybrids with higher levels of sugar accumulation and slower sugar-to-starch conversion post-harvest. The development of sugary, sugary enhanced, and shrunken 2 sweet corn varieties has been a key advancement in improving sugar content and maintaining sweetness during storage and processing (Williams *et al.*, 2021). These varieties are also designed to retain higher sugar levels for longer periods compared to traditional sweet corn varieties, which can rapidly convert sugars into starch after harvest, leading to a decline in sweetness (Williams *et al.*, 2021). This may have influence on consumers' choice and marketing opportunity.

Sidahmed *et al.*, (2025) also stated that one of the defining features of sweet corn is its high sugar content, which contributes significantly to its sweetness. The sugars in sweet corn are primarily sucrose, glucose, and fructose, with sucrose being the dominant sugar that gives the crop its characteristic sweet flavor. The concentration of sugars in sweet corn is highly variable and is influenced by both genetic factors and post-harvest conditions (Sidahmed *et al.,* 2025). During growth, sugar accumulation is primarily influenced by environmental factors such as temperature, soil fertility, and water availability, with cooler temperatures often leading to higher sugar concentrations. Also, the rate of sugar conversion to starch after harvest significantly impacts flavour and sweetness, with sweeter varieties retaining more sugar in the kernels post-harvest (Duvick and Rourke, 2019). The colour of sweet corn kernels is another critical factor influencing consumer preference (Evangelista and dR Felix, 2020). Depending on the variety, kernels may be yellow, white, or a combination of both (bicolor). Bright, vibrant colors indicate freshness and good nutritional quality, while dull or pale kernels may signal aging, improper storage, or nutrient deficiencies during growth (Azanza *et al.*, 2020). Hybrix 55 and Ayo F1 variety of sweetcorn had similar L* and a* colour value. Similar results were obtained by Alan *et al.*, (2014) in a two-year study on sweet corn that showed L* values were not significantly affected by varietal differences and harvest maturity.

The total soluble sugar of the sweet corn kernel that decreased while the starch content increased from the time of harvest to 72 hours after harvest suggests that holding sweet corn for extended periods leads to a rapid decline in quality, with sweetness, texture, and moisture decreasing as sugars convert to starch. The kernels lose moisture with increased holding period, becoming less juicy and tough over time, leading to shrivelling with a less plump appearance. The a* and b* colour values that were comparable from time of harvest till 72 hours after harvesting was contrary to the results obtained by Alan *et al.*, (2014).

CONCLUSION

Hybrid 55 variety of sweet corn kernels is sweeter with higher proximate composition. Ayo F1 and Hybrid exhibit similar kernel colour in terms of brightness and yellowness respectively. Holding time affects sweet corn quality. Sweet corn kernels at harvest are sweeter than those held for 72 hours. Sweetness of sweet corn kernel decreased with holding time while the starch content and colour (lightness) increased with holding time as sugar was converted to starch. Sweet corn held for 72 hours after harvest have more starch content. Hybrix 55 variety of sweet corn, is sweeter and maintains its nutritional content at harvest.

REFERENCES

Agrilasa, 2007. Handbook on Feeds and Plant Analyses. Agri Laboratory Association of South Africa.

Aina, V. O., Sambo, B., Zakari, A., Haruna, M. H., Umar, H., Akinboboye, R. M., and Mohammed, A. 2012. Determination of nutritional and anti-nutrient content of *Vitis vinifera* (Grapes) grown in Bomo (Area C) Zaria, Nigeria. *Advance Journal of Food Science and Technology* 4(6): 445-448.

Alan, O., Kinaci, G., Kinaci, E., Budak Bascift, Z., Sonmez, K., Evrenosoglu, Y., and Kutlu, I. 2014. Kernel Quality of Some Sweet Corn Varieties in Relation to Processing. *Notulae Botanicae Horti Agrobotanici* 42:414-419.

Association of Official Analytic Chemists (AOAC) 2003. In Methods of Analysis. Association of Official Analytic Chemists, Gaithersburg, MD, USA.

Association of Official Analytic Chemists (AOAC) 2005. In Official Method of Analysis. Association of Official Analytical Chemists. AOAC Washington, USA. Pg 116.

Azanza, F., Tracy, W.F., Wolf, M.J. 2020. Advances in sweet corn breeding for quality and productivity. *Horticultural Reviews 47:1-35*

Clark, D. 2019. Impact of holding time on the quality of sweet corn. *Journal of Agricultural Science* 42(3): 211-219.

Davis, D., and Green, G. 2018. The role of post-harvest handling in sweet corn quality. *Food Quality Journal* 36(1): 67-75.

Duvick, D.N. and O'Rourke, J.A. 2019. Environmental influences on sugar accumulation and flavor in sweet corn. *Journal of Agricultural Food Chemistry* 67: 6193–6200.

Evangelista, G.C. and Angelina dR Felix. 2020. Physical Characteristics and Proximate Composition of Three Commercial Shrunken 2 Varieties of Sweet Corn in the Philippines as Influenced by Harvest Maturity. *Asian Journal of Agriculture and Food Sciences* 8 (5):129 – 141.

FAO 2016. Food and Agriculture Organization of the United Nations. Statistical Database. https://www.fao.org

Lee, L., Wong, W., and Liu, L. 2021. Cold storage impacts on the post-harvest quality of sweet corn. *Postharvest Biology and Technology* 59(3): 330-339.

Lizaso, J.I., Boote, K.J., Cherr, C.M., Scholberg, J.M.S., Casanova, J.J., Judge, J., Jones, J.W. and Hoogenboom, G. 2007. Developing a Sweet Corn Simulation Model to Predict Fresh Market Yield and Quality of Ears. *Journal of American Society of Horticultural Science* 132(3): 415-422.

Odeyemi, O.M., Adebare, O.R. and Ajibola, O.W. 2024. Effects of variety and fertilizer type on physico-chemical composition of sweet corn (*Zea mays* L. saccharata Sturt) kernel. *Journal of Agricultural Science and Environmental Management* 24(2): 37-48

R Core Team 2024. R Statistical Software. A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Sidahmed, H., Vad, A. and Nagy, J. 2025. Advances in sweet corn (*Zea mays* L. saccharata) research from 2010 to 2025: Genetics, Agronomy and Sustainable Production. *Agronomy*, *15*(5): 1260 – 75

Swapna, G., Jadesha, G. and Mahadevi, P. 2020. Sweet corn- A future healthy human nutrition food. *International Journal of Current Microbiology and Applied Sciences*, 9(7): 3859 -3865.

Williams, P.H., Williams, M.M. and Dhaliwal, D.S. 2021. Breeding sweet corn for improved sugar content and flavor retention post-harvest. *Crop Science* 61: 991–1003.

Wolf, H.P., Lee, D., Roberts, K.L. and Smith, J. 2021. Harvest timing and moisture content effects on sweet corn texture and quality. *International Commission of Agricultural and Biosystems Engineering Journal* 23: 42–51

Wong, W., and Liu, L. 2017. Mitigating sugar loss in post-harvest sweet corn. *Food Preservation and Storage* 28(1): 89-95.

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