

Title: Standardization of process for freeze drying of baby corn slices (20.5.3.9)

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Investigators:

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Background and justification:

Baby corn (*Zea mays* L.) is one of the most important vegetable crops grown round the year in India (Singh *et al.*, 2015). Baby corn is becoming popular in domestic and foreign markets and has enormous processing and export potential. Baby corn (also known as young corn, mini corn or candle corn) is the ear of maize (*Zea mays* L.) plant harvested young, when the silks have either not emerged or just emerged and no fertilization has taken place. An interesting recent development is of growing maize for vegetable purpose (Dass *et al.*, 2008). Currently, Thailand and China are the world leaders in baby corn production. In India, baby corn is being cultivated in Meghalaya, Western Uttar Pradesh, Haryana, Maharashtra, Karnataka and Andhra Pradesh. Baby corn is a delicious, decorative and nutritious vegetable, without cholesterol. It is a low caloric vegetable which is rich in protein, fibre, calcium, potassium, phosphorus and ascorbic acid. The entire miniature ear of baby corn is edible. Baby corn can be eaten raw or cooked. It is used in variety of traditional and continental dishes besides being canned. It is used as decorative, crispy vegetable in salad, soup, pickles, pakodas, vegetable biryani, mixed vegetable, pasta, chutney and other favorite dishes (Asaduzzaman *et al.*, 2014). Thus, the present investigation entitled “Standardization of process for freeze drying of baby corn slices” was planned with the following objectives:

Objectives:

1. To standardize slice thickness for freeze drying of baby corn slices
2. To study effect of packaging material on quality of freeze dried baby corn slices during storage.

Year of Commencement: 2024-25

Technical Programme:

Ex. 1. Freeze drying of baby corn slices

Factor 1: Slices thickness (S)

S₁- 4 mm

S₂- 6 mm

S₃- 8 mm

Factor 2: Packaging material (P)

P₁- PP bags (380 gauge)

P₂- PE bags (380 gauge)

P₃-Aluminium laminated bags (380 gauge)

Treatment combinations

Sr. No.	Treatment combinations	Treatments details
1.	S ₁ P ₁	4 mm slices thickness and PP bag
2.	S ₁ P ₂	4 mm slices thickness and PE bag
3.	S ₁ P ₃	4 mm slices thickness and AL bag
4.	S ₂ P ₁	6 mm slices thickness and PP bag
5.	S ₂ P ₂	6 mm slices thickness and PE bag
6.	S ₂ P ₃	6 mm slices thickness and AL bag
7.	S ₃ P ₁	8 mm slices thickness and PP bag
8.	S ₃ P ₂	8 mm slices thickness and PE bag
9.	S ₃ P ₃	8 mm slices thickness and AL bag

Variety: GAYMH-1 (Gujarat Anand Yellow Maize Hybrid-1)

Design : CRD with factorial concept
No. of repetitions : 03
No of treatments : 9
No. of samples/treatment/repetition : 20
Hot water Blanching : 85°C for 2min
Sample size : 50 g
Dehydration temperature : 60°C
Storage Time : 6 months
Storage intervals : Initial, 3 and 6 months
Storage study : Ambient condition

Blanching temperature shall be standardized

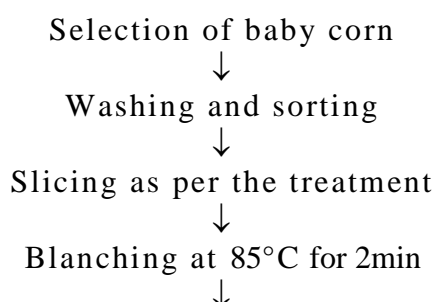
Harvesting stage of baby corn: Silky stage (After 55 days starts).

If possible shall be compared with conventional product available in the market.

If found necessary freeze drying shall be tried at 40, 45, 50 and 55°C temperature. As per trail 50°C was found best.

Observations to be recorded

1. Physico-chemical parameters <ul style="list-style-type: none">• Moisture (%)• TSS (°Brix)• Total sugars (%)• Acidity (%)• Ascorbic acid (mg/100g)• Fiber (%)• Protein (%)• Phosphorous (mg/100g)• Iron (mg/100g)• Calcium (mg/100g))• Total antioxidant (mg/g)• Total phenol (g/100 ml)• NEB (OD at 440 nm)• Ash (%)• Rehydration• Cooking quality	2. Sensory Parameters <ol style="list-style-type: none">1. Colour2. Texture3. Taste4. Flavour5. Overall acceptability
3. Microbial parameters <p>Aerobic plate count (CFU/g) Yeast, mould and E. coli (CFU/g)</p>	



Freezing the slices in -18°C



Dried in freeze drier at 50°C



Packaging as per the treatments



Sealing and Labeling and storage at room temperature

Principal steps used for freeze drying of baby corn