

Effect of Harvesting Stages and Brine Concentrations on Sensory Qualities of Canned Tender Jack (*Artocarpus heterophyllus* Lam.)

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(Received 21 September 2022, Accepted 03 November, 2022)

(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The level of acceptance by consumers plays a vital role in developing new food products. Consumer decisions about food products largely depend on their sensory profile. So, the experiment was carried out to know the effect of harvesting stages and brine concentrations on the sensory quality of canned tender jack (*Artocarpus heterophyllus* Lam.). The experiment was laid out in Factorial Completely Randomised Design with two factors viz., H- Harvesting stage at four different stages viz., H₁- 45 DAFS (Days After Fruit Set), H₂- 60 DAFS, H₃- 70 DAFS, H₄- 90 DAFS and B- Brine concentration at four different concentrations viz., B₁- 2 percent, B₂- 4 percent, B₃- 6 percent, B₄- 8 percent, and their interaction (H×B) in 3 replications. Among different harvesting stages and brine concentrations, H₂ (60 DAFS) and B₁ (2%) recorded the maximum score concerning appearance, texture, taste, and overall acceptability. Among different treatment combinations, H₂B₁ (60 DAFS in 2 % brine) showed better scores with respect to organoleptic parameters like appearance (4.86), texture (4.85), taste (4.90), and overall acceptability (4.87). Based on appearance, texture, taste, and overall acceptability, it was proved that H₂B₁ (60 DAFS in 2 % brine) is significantly suitable for preparing tender jack canning.

Keywords: Tender jack, harvesting stages, brine concentrations, organoleptic qualities.

INTRODUCTION

Sensory properties are one of the most critical quality attributes of any product and directly determine consumer satisfaction or overall acceptance based on color, taste, flavor, and aroma. The level of acceptance by consumers plays a vital role in developing new food products. Consumer decisions about food products largely depend on their sensory profile.

Tender jack is referred to as “poor man’s food” as it is cheap and abundant during summer. In its tender form (about 60 days of maturity), Jackfruit is generally consumed as a vegetable and is characterized by its flavor, meat-like texture, and color (Jagtap *et al.*, 2010). It is remarkably similar in texture to chicken meat, making jackfruit an excellent vegetarian substitute for meat. Canned jack fruit in brine is sometimes referred to as “vegetable meat” Marak *et al.* (2019).

Ready-to-cook (RTC) tender jackfruit is prevalent in urban areas of India, Sri Lanka, and other growing countries. Different companies have been developing new products from tender jack fruit, which is being

marketed as a ready-to-cook product.

The availability of tender jackfruit in the international market throughout the year is a critical aspect of its trade. However, several factors limit its year-round availability, including seasonal nature, geographically limited growth due to climatic variations, high perishability, and difficulties related to storage and transportation due to limited post-harvest technologies. This necessarily implies harvesting jackfruit at the tender stage, which suits its usage as a vegetable and the need for technologies for its processing and preservation. Hence, it is essential to develop and standardize a post-harvest technology for jackfruit that prolongs its shelf life without much alteration in the sensory quality attributes.

MATERIALS AND METHODS

The experiment was conducted at the Department of Post-Harvest Technology, College of Horticulture, Mudigere, from January 2022 to July 2022. The experiment was laid out in Factorial Completely

Randomised Design with two factors viz., H- Harvesting stage at four different stages viz., H₁- 45 DAFS (Days After Fruit Set), H₂- 60 DAFS, H₃- 70 DAFS, H₄- 90 DAFS and B- Brine concentration at four different concentrations viz., B₁- 2 percent, B₂- 4 percent, B₃- 6 percent, B₄- 8 percent, and their interaction (H×B) with 3 replications. Sensory evaluation of canned tender jack was done by preparing tender jack kabab, with respect to appearance, texture,

taste, and overall acceptability was adjudged on a 5-point hedonic scale (Ranganna, 1986) by a panel of 21 untrained judges, and mean score was presented.

RESULTS AND DISCUSSION

The scores recorded with respect to appearance, texture, taste, and overall acceptability are represented in Table 1.

Table 1: Effect of harvesting stage and brine concentration on sensory scores of canned tender jack.

Treatments	Appearance	Consistency	Taste	Overall acceptability
Harvesting stage (H)				
H ₁	4.73	4.77	4.36	4.62
H ₂	4.77	4.83	4.44	4.68
H ₃	4.75	4.77	4.41	4.64
H ₄	4.72	4.64	4.38	4.58
SEM±	0.004	0.003	0.051	0.034
CD @ 1%	0.015	0.012	0.199	0.132
Brine concentration (B)				
B ₁	4.84	4.78	4.87	4.83
B ₂	4.82	4.77	4.58	4.72
B ₃	4.63	4.71	4.19	4.51
B ₄	4.68	4.74	3.95	4.46
SEM±	0.004	0.003	0.051	0.034
CD @ 1%	0.015	0.012	0.199	0.132
Interaction (H×B)				
H ₁ B ₁	4.84	4.81	4.85	4.83
H ₁ B ₂	4.81	4.79	4.56	4.72
H ₁ B ₃	4.61	4.72	4.12	4.48
H ₁ B ₄	4.67	4.75	3.90	4.44
H ₂ B ₁	4.86	4.85	4.90	4.87
H ₂ B ₂	4.84	4.84	4.59	4.76
H ₂ B ₃	4.68	4.81	4.24	4.58
H ₂ B ₄	4.72	4.82	4.01	4.52
H ₃ B ₁	4.85	4.79	4.87	4.84
H ₃ B ₂	4.82	4.78	4.58	4.73
H ₃ B ₃	4.63	4.73	4.21	4.52
H ₃ B ₄	4.69	4.76	3.98	4.48
H ₄ B ₁	4.82	4.68	4.85	4.78
H ₄ B ₂	4.80	4.65	4.58	4.68
H ₄ B ₃	4.59	4.59	4.17	4.45
H ₄ B ₄	4.65	4.62	3.92	4.40
SEM±	0.008	0.006	0.102	0.068
CD @1%	0.030	0.025	0.398	0.264

Effect of harvesting stages and brine concentrations on appearance score of canned tender jack. Data obtained on the appearance differed significantly. With respect to harvesting stages, the maximum appearance score (4.77) was observed in H₂ (60 DAFS), whereas the minimum score (4.72) was recorded in H₄ (90 DAFS).

Significant variation was observed among different brine concentrations. The appearance score was obtained significantly maximum (4.84) in B₁ (2 %), while the minimum appearance score (4.68) was recorded in B₄ (8 %).

In the interactions between harvesting stages and brine concentrations, the maximum appearance (4.86) was recorded in the H₂B₁ (60 DAFS with 2 % brine concentration) combination, and the minimum appearance score (4.59) was recorded in H₄B₃ (90 DAFS with 6 % brine concentration) combination. This may be due to the browning of products among the higher salt concentration and the disintegration of pieces with the advancement of harvesting stages. The results are in agreement with Babu and Sudheer (2019).

Effect of harvesting stages and brine concentrations on texture score of canned tender jack. Texture scores differed significantly with respect to harvesting stages; the maximum texture score (4.83) was observed in H₂ (60 DAFS), whereas the minimum texture score (4.64) was recorded in H₄ (90 DAFS).

Among different brine concentrations, the texture score was obtained significantly maximum (4.78) in B₁ (2 %), while the minimum texture score (4.71) was recorded in B₃ (6 % brine concentration).

With respect to the interactions between harvesting stages and brine concentrations, the maximum texture score (4.85) was recorded in H₂B₁ (60 DAFS with 2 % brine concentration), and the minimum texture score (4.59) was recorded in H₄B₃ (90 DAFS with 6 % brine concentration) combination. Due to the higher fiber content with the advancement of maturity, tender jack pieces tend to disintegrate within the cans after thermal processing, which leads to loss of texture (Lakshmana *et al.*, 2013).

Effect of harvesting stages and brine concentrations on taste score of canned tender jack. Scores recorded of the taste differed significantly with respect to harvesting stages; the maximum taste score (4.44) was observed in H₂ (60 DAFS), whereas the minimum Taste score (4.36) was recorded in H₁ (45 DAFS).

Significant variation was observed among different brine concentrations; the maximum score (4.87) was recorded in B₁ (2 %), while the minimum taste score (3.95) was recorded in B₄ (8 %).

Among the interactions, the maximum taste (4.90) was recorded in the H₂B₁ (60 DAFS with 2 % brine concentration) combination, and the minimum taste score (3.90) was recorded in H₁B₄ (45 DAFS with 8 % brine concentration) combination. This is due to the higher brine concentration, which imparts more saltiness to the food and decreases its palatability of the food (Marak *et al.*, 2019).

Effect of harvesting stages and brine concentrations on overall acceptability score of canned tender jack.

Data obtained on the overall acceptability differed significantly with respect to harvesting stages, the maximum overall acceptability score (4.68) was observed in H₂ (60 DAFS), and the minimum score (4.58) was recorded in H₄ (90 DAFS) harvesting stages. In different brine concentrations, the overall acceptability score was obtained significantly maximum (4.83) in B₁ (2 %), while the minimum overall acceptability score (4.46) was recorded in B₄ (8 %).

Concerning interactions between harvesting stages and brine concentrations, the maximum overall acceptability (4.87) was recorded in the H₂B₁ (60 DAFS with 2 % brine concentration) combination, and the minimum overall acceptability score (4.45) was recorded in H₄B₃ (90 DAFS with 6 % brine concentration) combination. This may be due to differences in the scoring for consistency, appearance, and taste of the canned tender jack (Marak *et al.*, 2019).

CONCLUSION

Considering the obtained results with respect to the sensory qualities of canned tender jack. Among the harvesting stages and brine concentrations, H₂(60 DAFS) and B₁(2 %) respectively recorded higher scores. Concerning interactions, H₂B₁ treatment (60 days after fruit set with 2% brine concentration) recorded the maximum score concerning appearance, texture, taste, and overall acceptability.

FUTURE SCOPE

Future studies with respect to different jack varieties in order to evaluate the sensory qualities of canned tender jack.

Acknowledgment. The authors are thankful to the College of Horticulture, Mudigere- 577 132 Karnataka, India, for its facilities.

Conflict of interest. None.

REFERENCES

- Babu, P. S. and Sudheer, K. P. (2019). Quality Evaluation of Thermal Processed Tender Jackfruit During Storage. *Journal of Tropical Agriculture*, 58(1), 22-32.
- Jagtap, U. B., Panaskar, S. N., and Bapat, V. A. (2010). Evaluation of Antioxidant Capacity and Phenol Content in Jackfruit (*Artocarpus heterophyllus* Lam.) Fruit Pulp. *Plant foods for human nutrition*, 65(2), 99-104.
- Lakshmana, J. H., Jayaprabhash, C., Kumar, R., Kumaraswamy, M. R. and Kathiravan, T. (2013). Development and Evaluation of Shelf Stable Retort Pouch Processed Ready-to-Eat Tender Jackfruit (*Artocarpus heterophyllus*) Curry. *Journal of Food Processing and Technology*, 4(10), 274-280.
- Marak, N. R., Nganthoibi, R. K. and Momin, C. W. (2019). Process Development for Brining of Tender Jackfruit. *International Journal of Current Microbiology and Applied Science*, 8(4), 2408-2414.
- Ranganna, S. (1986). *Handbook of analysis and quality control for fruit and vegetable products*. Tata McGraw-Hill Education.

How to cite this article: K.R. Poornima, Y. Kantharaj, B.S. Shivakumar, N. Sudharani and Devaraju (2022). Effect of Harvesting Stages and Brine Concentrations on Sensory Qualities of Canned Tender Jack (*Artocarpus heterophyllus* Lam.). *Biological Forum – An International Journal*, 14(4a): 62-64.