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Impact of Harvesting Stages and Brine Concentration on Sensory Qualities of Retort Packed Tender Jack (*Artocarpus heterophyllus* L.)

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ABSTRACT: The sensory evaluation of food products is crucial aspect of assessing consumer acceptance, quality, and overall product performance. So, the experiment was laid out to know the effect of harvesting stages and brine concentration on the sensory quality of retort packed tender jack (*Artocarpus heterophyllus* L.). The experiment was laid out in Factorial Completely Randomized Design with 2 factors *viz*., H – harvesting stages at 2 different stages *viz*., H_1- 45 DAFS (Days after fruit set), H_2- 60 DAFS and brine concentration at five different concentration *viz*., 2,3, 4, 5, 6 percent and their interaction (H×B) in 3 replications. Among different harvesting stages and brine concentrations, H_2 (60 DAFS) and B_3 (4 %) recorded the maximum score concerning appearance, texture, color and overall acceptability. Among the treatment combinations, H_2B_3 showed better scores with respect to sensory parameters like appearance (4.86), texture (4.65), color (4.88) and overall acceptability (4.58). Based on appearance, texture, color and overall acceptability, it was proved that H_2B_3 (60 DAFS in 4 % brine) is significantly suitable for preparing retort packed tender jack.

Keywords: H – harvesting, Brine concentration (B), lowest score.

INTRODUCTION

The sensory properties of a product, such as color, taste, flavor, and aroma, are crucial in determining its quality and directly influence consumer satisfaction and acceptance. The level of consumer acceptance is essential when developing new food products, as purchasing decisions are often guided by the sensory characteristics of the product.

Jackfruit in its tender stage *i.e.* jack harvested at 60 DAFS (Days After Fruit Set) is usually consumed as vegetable. However, various factors hinder its year-round availability, including its seasonal nature, geographically restricted growth due to climatic conditions, high perishability, and challenges associated with storage and transportation due to limited post-harvest technologies (Poornima *et al.*, 2022).

To prevent wastage, surplus jackfruit should be processed and preserved using appropriate techniques that extend its shelf life while maintaining nutrition. (Jan *et al*., 2012).

To fulfill these goals, a retort pouch packaging method with thermal processing is an excellent alternative to metal cans. It is a flexible, laminated container that can endure thermal processing temperatures and offers the benefits of both metal cans and plastic packages. The key benefits of retort pouch packaging include easy bulk packing, lower transportation and material costs, rapid heat penetration, easy disposal without polluting the environment, and heat sealing. Furthermore, it has no effect on odor, flavor, texture, color, or food value. (Donald and Ricardo 2007). Tender jack harvested at 60 DAFS combined with appropriate brine in retort packaging is a better option to tin cans, and tender jack can also be provided during the off season.

MATERIAL AND METHODS

The experiment was conducted at the Department of Post-Harvest Technology, College of Horticulture, Mudigere, from January 2023 to July 2024. The experiment was conducted in factorial completely randomized design with two factors *Viz*., Harvesting stages at two levels H_1- 45 DAFS (Days After Fruit Set) and H_2- 60 DAFS other factor is brine concentration at five different concentrations *viz*., B_1- 2 percent, B_2- 3 percent, B_3- 4 percent, B_4- 5 percent and B_5- 6 percent and their interaction (HxB) with 3 replications. Sensory evaluation of retort packed tender jack with respect to appearance, texture, color and overall acceptability which was adjudged on a 5- point hedonic scale (Ranganna, 1986) by a panel of 20 untrained judges, mean score was presented.

RESULTS AND DISCUSSION

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

Table 1: Effect of harvesting stage and brine concentration on sensory parameters of retort packed tender jack (5 hedonic scale).

Treatments	Appearence	Texture	Color	Overall acceptability
Harvesting stage (H)				
H_1	4.68	4.34	4.77	3.84
H_2	4.80	4.45	4.83	4.16
SEm±	**0.010**	**0.013**	**0.023**	**0.019**
CD @ 1%	**0.039**	**0.032**	**0.042**	**0.052**
Brine concentration (B)				
B_1	4.65	4.22	4.50	3.85
B_2	4.78	4.82	4.67	4.23
B_3	4.82	4.84	4.78	4.39
B_4	4.68	4.63	4.74	3.92
B_5	4.61	4.70	4.48	3.89
SEm±	**0.0074**	**0.0073**	**0.013**	**0.028**
CD @ 1%	**0.015**	**0.018**	**0.043**	**0.083**
Interaction (H×B)				
H_1B_1	4.37	3.51	4.12	3.23
H_1B_2	4.42	3.59	4.70	4.01
H_1B_3	4.45	3.62	4.73	4.20
H_1B_4	4.39	3.89	4.58	3.52
H_1B_5	4.32	4.20	3.56	3.48
H_2B_1	4.73	3.23	4.68	3.98
H_2B_2	4.83	4.58	4.81	4.45
H_2B_3	4.86	4.65	4.88	4.58
H_2B_4	4.78	4.45	4.85	4.32
H_2B_5	4.70	4.39	4.67	4.22
SEm±	**0.088**	**0.018**	**0.016**	**0.032**
CD @1%	**0.026**	**0.030**	**0.030**	**0.12**

Effect of harvesting stages and brine concentrations on appearance score of retort packed tender jack. Table 1 shows that the appearance data varies greatly depending on the harvesting stage. H_2 (60 DAFS) had the highest appearance score (4.80), while H_1 (45 DAFS) had the lowest appearance score (4.68). Significant differences were found between brine concentrations and the appearance of retort packed tender jack. The highest appearance score (4.82) was obtained in B_3 (4%), followed by B_2 (3%) brine concentration (4.78), and the lowest appearance value (4.61) was obtained in B_5 (6%). The interaction between harvesting stages and brine concentrations, the maximum appearance (4.86) was recorded in the H_2B_3 (60 DAFS with 4% brine concentration) combination, which was on par with H_2B_2 (4.83) and the minimum appearance score was (4.32) obtained by H_1B_5. This may be due to the browning and disintegration of product among the higher salt concentration. The results are in agreement with Babu and Sudheer (2019).

Effect of harvesting stages and brine concentrations on texture score of retort packed Tender Jack. Table 1 shows that texture scores changed significantly depending on harvesting stage. The highest texture score (4.45) was recorded in H_2 (60 DAFS). The H_1 had a minimum texture score of 4.34 (45 DAFS). There was significant fluctuation between brine contents. The texture score was much higher (4.84) in B_3 (4%), followed by B_2 (3%) brine concentration (4.82). The lowest score (4.22) was earned in B_1 (2%). In terms of interactions, the H_2B_3 (60 DAFS with 4% brine concentration) combination had the highest texture score (4.65), followed by H_2B_2 (4.58), while the lowest texture score (3.23) was reported in H_2B_1 (60 DAFS with 2% brine concentration). Tender jack has a relatively delicate cell structure, low brine concentration might not create enough osmotic pressure to effectively draw out excess water or strengthen the cell walls, leading to softer texture. Similar results were found by Kaur *et al*. (2023).

Effect of harvesting stages and brine concentrations on color score of retort packed tender jack. Colors vary greatly between harvest phases. The highest color score (4.83) was recorded in H_2 (60 DAFS). The lowest color score (4.77) was registered in the H_1 (45 DAFS). The hue of tender jack varied significantly between brine concentrations. The color score was much higher (4.78) in B_3 (4%), followed by B_4 (5%) brine concentration (4.74). The lowest color score (4.48) was observed in B_5 (6%) brine concentration. In the interactions, the maximum color (4.88) was recorded in the H_2B_3 (60 DAFS with 4% brine concentration) combination, followed by H_2B_4 (4.85), while the least color score (3.56) was obtained in H_1B_5 (45 DAFS with 6% brine concentration). The exposer of fruits during processing leads to oxidization of phenols and reduces the lightness of the fresh, this may lead to decreasing in

the color as compared to fresh fruits. The results also coincide with Babu and Sudheer (2019).

Effect of harvesting stages and brine concentrations on overall acceptability score of retort packed tender jack. Significant difference was seen with respect to overall acceptability in harvesting stages, H_2 (60 DAFS) had the highest overall acceptability score (4.16), whereas H_1 (60 DAFS) had the lowest (3.84). Significant variation was seen across brine concentrations. The highest concentration (4.39) was found in B_3 (4%), followed by B_2 (3%) brine (4.23). The lowest overall acceptability score (3.85) was found for B_1 (2%) brine concentration. Among the interactions, the H_2B_3 (60 DAFS with 4% brine concentration) combination had the highest overall acceptability score (4.58), followed by H_2B_2 and H_2B_4 (4.45 and 4.32, respectively), and the H_1B_1 (45 DAFS with 2% brine concentration) combination had the lowest overall acceptability score (3.23), followed by H_1B_5 (45 DAFS with 2%), which had an overall acceptability score of 3.48.This may be due to differ in the scoring for appearance, texture and color of retort packed tender jack (Sagar and Kumar 2010).

CONCLUSIONS

Considering the obtained results with respect to the sensory qualities of retort packed tender jack. Among the harvesting stages and brine concentrations, H_2 (60 DAFS) and B_3(4%) respectively recorded higher scores. Concerning interactions, H_2B_3 treatment (60 days after fruit set with 4% brine concentration) recorded the maximum score concerning appearance, texture, color, and overall acceptability.

FUTURE SCOPE

Further studies are required to evaluate soft flesh and hard flesh of Jack cultivars for retort packaging

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Conflict of Interest. None.

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