

Storage Characteristics of Ready to Serve Fried Thelly Prawns (*Metapenaeus dobsoni*) at Ambient Temperature

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Results of a study on the storage characteristics of ready to serve dried and fried prawns (*Metapenaeus dobsoni*) packed in polyester/polythene bags and stored at ambient temperature (22-28°C) are presented. Treatments with common salt (sodium chloride) and citric acid prior to initial sun drying is found to enhance both quality and shelf-life of the final fried product. While the untreated dried and fried prawns showed a storage life of 42 days, the test sample remained in acceptable condition upto 55 days. Dried and fried prawns appear to be a promising and appealing ready to serve product, ideally suited for the urban consumer market.

The processed food market in India, especially in the urban area is witnessing a silent revolution. Hygienic and nutritious convenience foods with appealing flavor are gaining acceptance in urban markets. Semi-processed food products which need only minimum cooking or frying like noodles, battered and breaded products etc. have already appeared in the market on a fairly large scale. However, ready to serve products of reasonable shelf-life are yet to gain popularity. Such items, if prepared and stored properly, are sure to be the choice of the urban working force. Systematic studies on their nutritional quality and storage characteristics are required before popularising such products in a tropical country like India where spoilage can be fast and hazardous to health.

This paper is an attempt to study the shelf-life and storage characteristics of a ready to serve product (fried prawns) packed in polyester/polythene bags and stored at ambient temperature.

Materials and Methods

Fresh thelly prawns (*Metapenaeus dobsoni*) of average count 1000-1200/kg procured from market were repeatedly washed with potable water to remove the

adhering dirt and then dried in sun as such (control) and also after treatment with sodium chloride and citric acid as prescribed by Joseph *et al.* (1988) (Test sample). The dried samples were fried in refined groundnut oil after removing head, tail and legs. The fried samples were cooled, and packed hygienically in polyester bags laminated with low density polythene (12 micron polyester laminated with 44 micron L D P E). The fried samples, both control and test, were stored at ambient temperature (22-28°C). The samples were drawn at intervals and analysed for physical, chemical, organoleptic and bacteriological characteristics.

Moisture, sodium chloride and fat were determined according to AOAC (1975). Total volatile basic nitrogen (TVBN) was determined by the method of Conway (1947). Free fatty acids (FFA) was determined by the method of AOCS (1946) and expressed as oleic acid percentage. Total aerobic bacterial plate count (TPC) was determined by the standard pour plate method using Tryptone glucose agar (IS:2237, 1971). The organoleptic characteristics were assessed by a trained taste panel and the scoring was done using a 10 point hedonic scale, 10 being very good,

0 being bad and 4 being just unacceptable taking into consideration the changes in odour, texture and flavour of the samples (CIDA/FAO/CECAP, 1977).

Results and Discussion

The control and test samples had fat content (dry weight basis) of 37.74 and 37.3% and sodium chloride content (dry weight basis) of 0.51 and 4.17% respectively. Changes in chemical characteristics and total bacterial count of control and test samples are given in Table 1. Initial moisture content of test sample was slightly higher than that of the control, probably due to the higher equilibrium moisture content and lower rate of drying of the salted sample. A marginal increase in moisture content was noted during storage for both control and

test samples. Initial TVBN value of the control sample was higher than that of the test sample due to the preservative action of sodium chloride and citric acid thereby reducing the chances of spoilage in test samples. A gradual increase in TVBN value was noticed in both samples, during storage. Almost a similar trend was noticed in the case of free fatty acid contents, both in control and test samples. These results confirm the preservative action of sodium chloride and citric acid. Initially total plate count was insignificant both in control and treated samples and during storage it indicated a decreasing trend.

Organoleptic characteristics of test samples were better than those of the control samples initially and also during

Table 1. *Changes in chemical and bacteriological parameters of control and test samples during storage.*

Storage period, days	Moisture, %		TVBN, mg/100g (DWB)		FFA, Oleic acid % (DWB)		Total plate count/g	
	1	2	1	2	1	2	1	2
0	6.17	8.85	41.77	18.43	2.13	1.86	52	89
3	7.07	9.89	43.68	31.07	3.07	2.04	-	-
9	6.18	9.28	44.76	38.58	2.82	2.34	75	51
12	6.60	9.13	52.46	43.13	3.76	2.99	75	42
17	8.82	9.77	41.45	40.56	4.03	2.99	33	30
22	8.58	9.71	-	44.83	3.93	2.54	74	53
29	6.29	9.45	50.79	41.80	-	-	20	20
42	7.36	9.59	58.93	50.00	3.91	2.50	20	20
55	-	9.60	-	55.30	-	3.04	-	20

DWB = Dry weight basis; 1 = Control; 2 = Test sample

Table 2. *Changes in sensory characteristics of control and test samples during storage*

Storage period, days	Physical characteristics		Organoleptic score	
	Control	Test sample	Control	Test sample
0	Reddish brown colour, firm and crispy texture, pleasant odour and sweet flavour	Reddish brown colour, firm and crispy texture, pleasant odour and very good sweet flavour	7.0	8.5
3	Reddish brown colour, crispy texture and slightly pleasant odour and flavour	Reddish brown colour, crispy texture, pleasant odour and good sweet flavour	6.5	8.0
9	Reddish brown colour, loss of crispness, satisfactory odour and flavour	Reddish brown colour, loss of crispness, good odour and flavour	6.0	7.5
12	Reddish brown colour, loss of crispness, slightly aged odour and satisfactory flavour	Reddish brown colour, loss of crispness, good odour and flavour	5.5	7.4
17	Reddish brown colour, loss of crispness, aged odour, satisfactory flavour	Reddish brown colour, loss of crispness, good odour and flavour	5.0	7.3
22	"	"	5.0	7.2
29	Reddish brown colour, loss of crispness and slightly deteriorated odour and flavour	Reddish brown colour, loss of crispness, good odour and flavour	4.5	7.0
42	Reddish brown colour, soft texture, spoiled odour and flavour	Reddish brown colour, loss of crispness, satisfactory odour and flavour	4.0	6.0
55	--	Reddish brown colour, soft texture, aged odour and just satisfactory flavour.	--	4.5

storage days (Table 2). After 42 days, control samples become just unacceptable taking into consideration its odour, flavour and texture. The treated samples were in acceptable condition even after 55 days storage at ambient temperature.

These studies thus show that if processed with care and stored carefully in suitable packaging, dried and fried prawns can be marketed safely as a ready to serve delicacy. The treatment suggested enhances the flavour and acceptability. Both test and control samples have shelf-lives beyond a period within which they are usually marketed as acceptable at ambient temperatures.

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