



Shelf life of fresh *Penaeus monodon* and *Farfantepenaeus notialis* using different storage conditions

Olawusi-Peters, O.O.; B.O. Igbagbo and O.A. Bello-Olusoji*

Department of Fisheries and Aquaculture Technology, The Federal University of Technology, P.M.B. 704, Akure, Nigeria



Introduction

- ❖ Sustenance of food security in Sub-Sahara Africa face many challenges especially postharvest losses.
- ❖ To achieve the UN agenda 2030 on food security, postharvest losses in fish products must be addressed.
- ❖ Shellfish is a source of protein and calcium and contributes tremendously to the nutrition of the impoverished coastal people.
- ❖ Shrimp production from captured fisheries with capacity of 12,000 metric tons (MT) per year is still higher than production from aquaculture sector.

Objective

- ✓ Physical changes in Fresh *Penaeus monodon* and *Farfantepenaeus notialis* under different storage conditions.
- ✓ Chemical changes in Fresh *P.monodon* and *F.notialis* under different storage conditions.
- ✓ Shelf life of Fresh *P.monodon* and *F.notialis* under different storage conditions.

Materials and Methods

Fresh *P. monodon* and *F. notialis* were collected from Karflex jetty kirikiri town Apapa, Lagos State with otter-trawl net, 15mm mesh size at the sides and 12mm at the end. Fishing ground FAO zone 34100 nautical miles. The freshly collected Prawns were transferred in Vacuum Flask to the nutrition laboratory in the Department of Fisheries and Aquaculture Technology, Federal University of Technology, Akure, for further analysis. Body weight (g) was measured to the nearest 0.1g using Mettler weighing balance. Shrimp specimen were distributed into five groups A, B, C and D. Group A was Freezed at -15°C; Group B was Oven dried at 80°C for 10 hours (to attain constant weight) and stored at room temperature (25-27°C) for eight weeks, after pulverised in a mortar, packed in Polythene bags and stored for subsequent chemical analysis. Group C was smoked dried using FUTA fish farm smoking kiln at 105-110°C for 5 hours, milled, wrapped in Cellophane bags and stored for eight weeks. 20mg was taken every two weeks for chemical analysis. Group D was salted immersion in a brine solution (360 grams of common salt in a litre of water) for 4 days.

Proximate Analysis: Before and after the experiment, the crude protein, lipid, total ash, crude fibre and moisture content were determined according to Association Official Analytical Chemistry (AOAC, 1995)..

TABLE 1: PROXIMATE COMPOSITION OF *P. monodon* and *F. notialis*

Preservative Method	Species	Week	%moisture	%ash	%fat	%protein	%CHO
FROZEN	F.notialis	initial	32.41±0.08	6.53±0.04	2.23±0.04	45.71±0.23	13.12±0.07
		2	36.04±1.45	1.63±0.71	1.5±0.71	43.65±1.49	17.18±4.36
		4	41.14±0.91	2.01±0.01	1.56±0.07	40.28±0.78	15.01±0.21
	P.monodon	initial	46.18±1.38	1.44±0.01	1.55±0.16	35.18±1.97	15.65±0.75
		2	31.07±1.74	7.73±1.74	2.69±0.67	52.59±1.63	5.92±2.31
		4	33.39±2.76	2.49±0.01	2.67±0.66	50.19±1.39	11.26±4.81
SMOKED	F.notialis	initial	35.12±3.70	2.32±0.03	2.02±1.42	46.68±0.81	13.86±5.96
		2	45.28±0.09	1.27±0.03	1.86±0.44	45.06±1.34	6.53±1.90
		4	11.41±0.79	14.15±0.21	1.73±0.69	61.73±0.81	10.98±1.12
	P.monodon	initial	11.59±1.55	14.67±0.70	1.23±0.03	56.10±1.53	16.41±2.35
		2	12.97±0.94	13.6±1.56	1.16±0.07	52.29±2.26	19.98±4.83
		4	14.14±0.90	10.06±0.78	1.07±0.03	50.98±0.54	23.75±0.85
OVEN-DRIED	F.notialis	initial	12.19±0.32	13.24±1.05	1.14±0.06	65.08±1.39	8.35±3.25
		2	11.86±0.93	12.65±0.72	1.17±0.04	63.94±5.98	10.38±7.59
		4	13.21±1.53	12.7±0.91	1.15±0.12	60.72±0.20	12.22±2.52
	P.monodon	initial	14.57±0.64	9.05±0.70	1.06±0.08	56.09±1.10	18.78±0.96
		2	7.45±0.06	10.77±0.10	1.27±0.36	70.92±1.19	9.59±1.51
		4	6.87±1.36	11.65±0.77	1.58±0.03	67.35±0.71	12.55±2.82
SALTED	F.notialis	initial	6.53±1.88	11.90±1.12	1.61±0.71	65.03±0.66	14.93±1.62
		2	9.06±0.21	10.63±0.72	1.02±0.01	62.34±0.13	16.95±0.40
		4	5.38±1.66	14.71±0.71	1.63±0.69	74.86±0.17	3.42±1.53
	P.monodon	initial	5.95±1.05	15.38±0.58	1.13±0.01	72.64±1.51	4.90±3.15
		2	6.65±0.06	14.75±0.78	1.13±0.04	70.18±0.62	7.29±1.491
		4	8.88±0.75	10.74±0.90	1.09±0.01	67.98±0.79	11.39±0.95
SALTED	F.notialis	initial	19.48±2.09	8.94±1.31	1.19±0.28	47.07±1.42	23.32±5.19
		2	22.66±0.78	20.07±0.18	1.32±0.11	45.88±0.88	10.07±1.59
		4	25.35±0.34	15.62±2.11	1.33±0.13	40.86±0.33	16.84±62.4
	P.monodon	initial	30.16±0.86	12.95±0.77	1.05±0.01	35.11±2.84	20.73±4.48
		2	21.99±1.05	16.88±0.52	1.70±0.44	50.73±0.65	8.70±1.78
		4	23.95±0.77	16.95±1.55	1.80±0.58	47.69±0.02	9.61±1.76
P.monodon	initial	23.89±0.84	15.69±0.83	1.26±0.07	45.62±0.83	13.54±2.57	
	6	27.99±0.62	11.71±0.62	1.13±0.03	35.57±0.88	23.60±0.33	

Results and Discussion

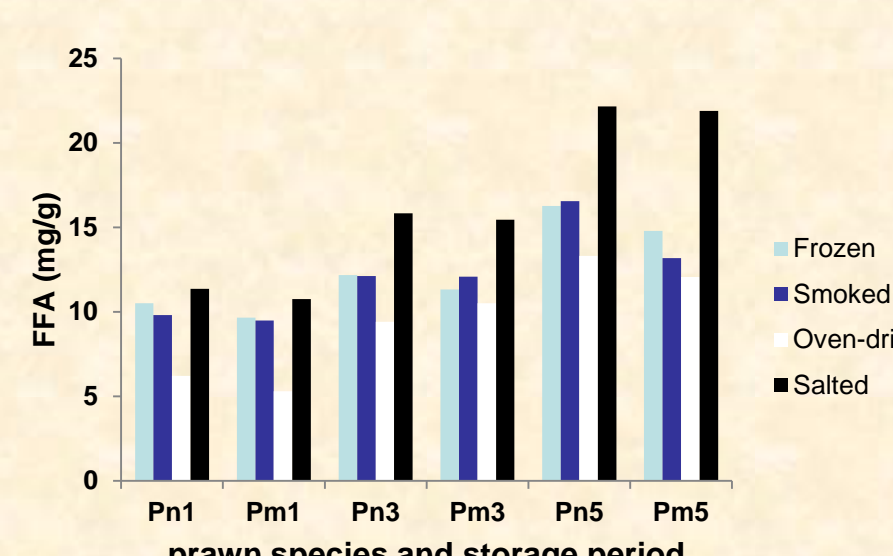
Oven dried samples have a higher protein values than the smoked and the salted samples, 74.86% and 70.92% for P.monodon and F.notialis respectively. Moisture content varied between the species with a maximum of 46.18% in frozen and minimum level in oven dried samples having an average of 5.38%.

CONCLUSION

- ❖ Smoked *P. monodon* is most liable to spoilage due to the highest value of TVN than oven-dried and frozen samples. Gradual increase in TVN value indicated that stored products held at ambient temperature gained moisture content from the environment.
- ❖ Oven-dried products are the best products due to its high protein content in both species. Smoked is liable to quick spoilage in both species. Frozen *F. notialis* can exceed three weeks for storage while *P. Monodon* cannot exceed 3 weeks for acceptability. Also, salted *F. notialis* cannot exceed the 5th week for freshness and *P. monodon* at 3rd week is suitable, any value beyond this implies spoilage in the samples. Sustenance of food security in Sub-Sahara Africa face many challenges especially postharvest losses.

References

AOAC. 1995. *Official methods of analysis of the Association of Official Analytical Chemists*. 16th edition. Washington, DC, Association of Official Analytical Chemists.



TREND OF FREE FATTY ACID DURING STORAGE PERIOD.

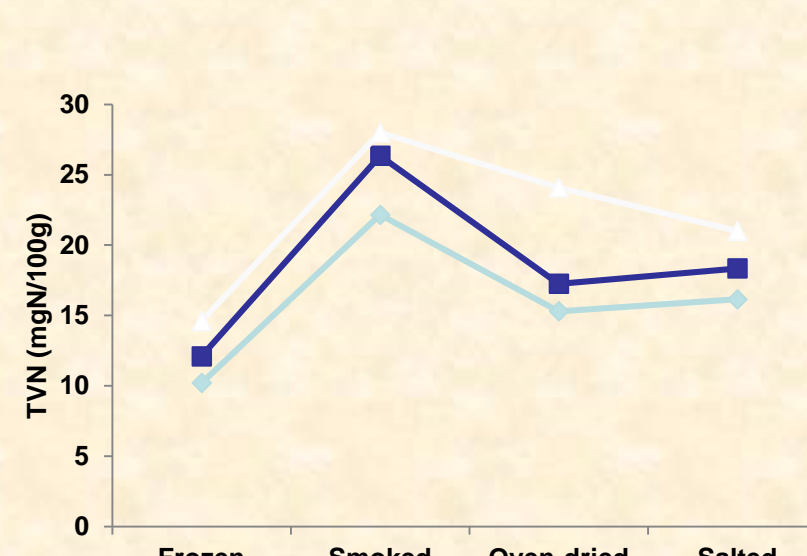


Figure 3 a Changes in *P.monodon* TVN during storage

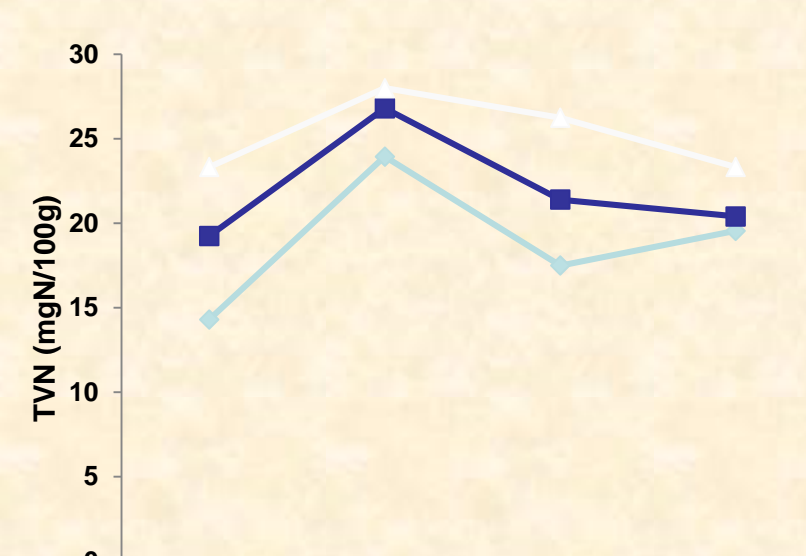


Figure 3 b Changes in *F. notialis* TVN during storage