

A SIMPLE AND CHEAP METHOD FOR MINIMISING THAWING AND COOKING LOSSES FROM PRAWNS

A dip method for minimising thawing and cooking losses from prawns was reported (Mathen, 1968). Though the dip method achieved the primary aim of improving yields without adversely affecting them biochemically and organoleptically, it has the disadvantages that the treatment cost is high and that an additional step is necessary in the processing line. These disadvantages are overcome in a modified method. The standardisation of the modified method is the subject of this communication.

While carrying out trials with various mixtures of sodium tripolyphosphate (STPP) with other chemicals it is noted that when potassium dihydrogen phosphate (PDP) is used to neutralise STPP (12%) resultant solution is highly effective in minimising drip loss from frozen prawns. Experiments with peeled and deveined prawns (P&D) using varying concentrations and volumes of solutions of STPP+PDP were carried out to determine the optimum concentration and volume of the solution. The biochemical, organoleptic and physical characteristics of the material were determined by the same procedures reported earlier (Mathen, 1968).

Table I shows the results on thawed

and cooked yields when 450 g portions of P&D prawns were treated with 40 ml solutions of varying concentrations and varying volumes of 16% solution. These results show that 40 ml of 16% solution is the optimum required per 450 g. Table II gives the physical, biochemical and organoleptic qualities of the raw prawns, as also of treated and untreated ones. It is observed that the thawed yield is cent percent, and cooked yield 14% higher than those of untreated. The biochemical characteristics of the treated ones are almost similar to the raw material suggesting least changes in quality by treatment. The inorganic phosphorus content is 250 mg% higher in treated samples. Table III gives the theoretical maximum levels of solids, phosphorus, sodium and potassium introduced into prawns by the treatment. However in actual practice these levels will still be lower and available literature shows that these levels are not harmful. The method is effective for froglegs and may prove useful in canning of prawn also. For application in large scale freezing of 2.27 kg blocks the following method is recommended. (1) Drain the washed prawns by spreading them on perforated and slanting tables a least for ten minutes. (2)

TABLE I EFFECT OF VARYING CONCENTRATIONS AND VOLUMES OF STPP + PDP ON THAWED AND COOKED YIELDS

Vol. of Soln. (16%) / 450 g	Thawed Yield %	Cooked Yield %	Conc. (%) of Soln 40 ml / 450 g	Thawed Yield %	Cooked Yield %
0	95.7	44.9	0	92.0	45.5
10	98.9	49.3	10	95.0	52.6
20	98.9	55.3	12	97.7	55.3
30	101.1	58.2	14	100.0	58.7
40	104.2	62.2	16	102.2	61.8
50	104.2	62.7	18	102.2	62.2

TABLE II BIOCHEMICAL AND ORGANOLEPTIC QUALITIES OF
PRAWNS TREATED WITH STPP + PDP

	Raw material	Control	Treated
Thawed yield%	—	88.2	103.3
Cooked yield%	55	52.9	67.2
Moisture%	83.4	82.5	82.8
Total nitrogen (TN)mg%	2235	2522	2207
Salt soluble nitrogen% TN	90.2	81.0	88.0
Myosin nitrogen% TN	59.6	54.9	58.8
Water soluble nitrogen% TN	34.5	32.1	34.6
Total non-protein nitrogen% TN	12.1	10.7	11.3
Free α -amino nitrogen % TN	3.9	3.5	4.5
Inorganic phosphorus mg%	75.0	75.0	325.0
Organoleptic quality	Fair	Fair, dried up appearance	Fair, pleasing appearance

TABLE III MAXIMUM AMOUNTS OF SOLIDS,
Na, K AND P ADDED TO PRAWNS
BY THE TREATMENT

Component	Max. amount mg%
Solids	1422
Potassium	101.2
Phosphorus	350.2
Sodium	333.5

Weigh 2.32 kg each into plastic basins (3) Add 200 ml of 16% solution of 3 parts STPP and 1 part PDP. (4) Mix the prawns and solution by hand and transfer to freezing cartons lined with polythene (5) Freeze without further addition of water. For cooked frozen product the P&D prawns and solution are mixed in the ratio of 90 ml/kg and cooked as usual.

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The advantages of the method are (1) The excess weight of prawns usually added to compensate for thawing losses (nearly 10%) is saved (2) the cost of treatment is low—roughly Rs 70/ton of prawns at the existing price of chemicals (3) the dimensions of the freezing cartons and master cases can be slightly reduced (4) The water extractable nitrogen does not become insoluble as is the case with the STPP + SDP treatment.

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REFERENCES

Mathen, Cyriac 1968. *Fish Technol.*, V (2), 104.

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