

ON SUN-DRYING OF BOMBAY DUCK

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Sun-drying of Bombay duck by hanging on scaffolds gave better products than those obtained by drying them in trays. Optimum rate of drying and quality of dried product were obtained when the fish were suspended at the rate of 50 to 60 per meter length of the rope. The quality of the raw material as affected by the delays in different hauls in the fishing trip was reflected in the dried products also.

INTRODUCTION

Bombay duck forms one of the largest fishery in the Gujarat State. About 40,000 tons of fresh Bombay duck are landed every year in different landing centres from Kolak in South Gujarat to Madhwad in the Saurashtra region. Although the fishery is spread all along the coast, bulk quantities of the fish are landed in three important centres, viz., Jafrabad, Nawabunder and Rajpara. Only a small quantity of the total landings is consumed in fresh condition, the remaining being converted into dried products for internal as well as foreign markets. No standards were followed till recently in handling, processing, packing and storage of the fish in spite of its being produced in large quantities.

The fish is caught in Dol nets by sail boats from grounds extending from 8 to 20 fathoms depth. Depending upon the distance from the shore to the fishing

ground, these boats take 4 to 8 hours to reach the ground or to return to shore. The fish hauled from the net are usually kept on the deck or in the fish holds without icing. The existing practice of drying involves washing of the landed fish in creek water and then hanging them on horizontal ropes (scaffolds) for drying after interlocking pairs at the jaws. The length of the rope varies, the average being about 55m. These ropes having a diameter of about 4 cm are tied to vertical logs or poles fixed on the shore at a distance of 3.5 to 4 m, the height of the poles being about 2.5 m. Ten to twelve such ropes are tied horizontally one above the other leaving a space of approximately 30 cm. Eighty to hundred fish are hung per metre length of the scaffold.

Considering the magnitude of the fishery and the trade potential of the dried products, standardisation of procedures for preservation and processing was found to be an urgent need. The present

communication reports results of some of the investigations in this direction

MATERIALS AND METHODS

Analysis of the fish landed by sail boats was carried out to assess the quality. Fish from different hauls were separated and sun-dried. The quality of fresh and dried fish was determined by organoleptic and chemical tests. Trimethylamine nitrogen (TMAN) and total volatile nitrogen (TVN) were determined by Conway's method (1947) using trichloro-acetic acid extract of the muscle. α -amino nitrogen was estimated by the method of Pope and Stevens (1939).

Drying of the fish was carried out

by spreading the fish on wooden trays which were placed on racks one above the other about 30 cm apart. Drying rate was followed by weighing the fish at intervals and noting loss in weight. Variations in drying rates due to varying interspaces between the adjacent fish on the scaffold were studied. For varying the interspaces between adjacent fish, the number of fish per unit length of scaffold was varied.

RESULTS AND DISCUSSION

The quality of the raw material landed showed large variations. Table I shows the variation in the quality of Bombay duck belonging to different hauls on landing and the quality of the corresponding dry products.

TABLE I THE QUALITY OF FRESH AND DRY BOMBAY DUCK BELONGING TO DIFFERENT HAULS

No. of hauls	Body colour	Gill colour	Fresh fish Texture Smell		T. M. A. N. mg%	T. V. N. mg %	α -amino N: mg%	Dry fish Colour T.V.N. mg%	
1st haul	Grey or black	Greyish shiny	Very soft	Distinctly putrid	25	70.5	20.7	Yellow or greyish	256
2nd haul	greyish	Pale yellow slime covered	Soft	Slightly putrid	15	31.0	17.0	Pale yellow	221
3rd haul	White or greyish	Covered with white slime	Stiff or slightly soft	Slightly fishy	2	10.0	11.1	White	151
4th haul	Reddish and white	Bright red	Firm	Sea weedy or of fresh fish	Negligible	6.0	7.5	White	132

It is obvious from the physical characteristics of the fish from different hauls, that the fish from the first haul undergoes maximum spoilage as it is placed at the bottom and kept for longer period before processing starts. The fish from the last haul reaches the shore in more or less fresh condition. The initial spoilage in the starting material is reflected in the poor quality of the dry product obtained from them as can be seen from

the yellow or greyish discolouration and a very high value for TVN in such samples.

Regarding the drying technique itself, hanging of the fish on horizontal ropes was found to be more effective. Table II shows the loss of weight per 100kg of fresh fish when dried by spreading the fish on trays kept on a rack, one above the other, at a distance of about 30 cm as well as when dried by hanging the fish on horizontal ropes.

TABLE-II LOSS OF WEIGHT PER 100 kg FRESH FISH DURING DRYING BOMBAY DUCK IN TRAYS AND ON SCAFFOLDS

Drying period		In trays			On scaffolds
		Bottom tray kg.	Middle tray kg.	top tray kg.	hanging kg.
3 hrs.	Day	14.6	18.9	19.4	20.0
18 „	Night	30.8	36.3	37.3	46.0
21 „	Day	48.5	50.8	52.2	58.0
24 „	Day	64.6	66.1	66.4	68.5
27 „	Day	71.5	74.9	76.1	76.5
42 „	Night	84.6	84.4	86.2	87.0
51 „	Day	86.2	86.0	86.6	88.5

The fish dried by spreading on trays had better appearance though the drying rate was slow and the drying was non-uniform. On the other hand fish dried on scaffolds showed more uniform drying in less time. Other advantages of drying Bombay duck on scaffolds are that it requires less space and the scaffolds are cheaper than trays.

Having adopted the hanging method of drying, the effect of leaving small gap between the adjacent fish on the scaffold was studied. The loss in weight of 100 kg fresh fish when dried in scaffold by hanging varying numbers per meter length of scaffold is given in Table III A and the quality of the dry product obtained is

given in Table III B.

It is seen from Tables III A & B that the drying rate is accelerated by leaving a gap between the adjacent fish on the scaffold. The optimum gap is obtained when 50-60 Bombay duck of normal size are hung per meter length of the rope. Leaving more gap does not materially increase the rate of drying. Moreover physical appearance and quality of the fish are improved by drying the fish leaving the optimum gap between the adjacent fish which facilitates uniform drying also.

CONCLUSIONS

To improve the quality of dry Bombay duck, it is essential that the raw material

TABLE III A LOSS OF WEIGHT OF BOMBAY DUCK WHEN HUNG ON SCAFFOLDS AT VARYING NUMBERS / UNIT LENGTH OF ROPE

Drying period		85/M loss/100 kg. fresh	65/M loss/100 kg. fresh	50/M loss/100 k.g fresh	35/M loss/100 k.g fresh
12 hrs.	Night	26.0	29.0	36.0	38.0
15 „	Day	43.0	47.5	53.0	56.0
18 „	Day	55.5	58.0	64.0	64.0
21 „	Night	62.5	65.0	68.5	70.0
36 „	Night	72.5	81.5	80.5	80.0
40 „	Day	79.0	85.5	86.0	86.0
42 „	Day	80.0	—	86.0	—
44 „	Day	81.5	87.0	86.0	86.5

TABLE III B QUALITY OF THE DRY PRODUCT WHEN DRIED ON SCAFFOLDS AT VARYING NUMBERS / UNIT LENGTH OF THE ROPE

		85/M	65/m	50/M	35/M
Colour	} Tinto meter reading	Yellow 1.6	Yellow 1.5	Yellow 1.0	Yellow 1.0
Lovibond		Red 1.0	Red 0.7	Red 0.7	Red 0.7
T. V. N. mg %		218.4	146	143	140

is brought in absolutely fresh condition. This may be achieved by making two hauls only when icing is not carried out on board or preserving the fish in the holds in ice if more hauls are to be made. The fish must be washed free of mud in clear sea water and other adhering impurities. The fish must be dried on scaffolds taking necessary care to see that sufficient gap is left between adjacent fish.

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