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Frozen Storage Characteristics of Ribbon Fish

Ribbon fish *(Trichiurus* sp.*)* is landed in larger quantities, especially along the Gujarat coast. At present the fish goes mostly for making low quality fish meal. Some general suggestions for its utilization as cured products have been reported by Devadasan & Venkataraman (1978). The frozen storage characteristics of ribbon fish in different forms are reported in the present communication.

Fresh ribbon fish procured from the local fish landing centre were cleaned, beheaded, gutted, washed well in potable water, cut into pieces of about 20 cm length and washed again. After draining, the fish was divided into 3 lots. One lot was frozen as blocks of 1 kg each (with 8–12 pieces of fish in each) in freezing trays, second lot was frozen after wrapping each piece individually in polythene paper, third one was carefully deboned, minced, frozen as blocks of 1 kg each at–40°C and stored at–18°C.

The fish was analysed for its chemical characteristics before and immediately after freezing and thereafter at regular monthly intervals. Moisture, total nitrogen (TN), total non-protein nitrogen (TNPN), water soluble nitrogen (WSN) and salt soluble nitrogen (SSN) were determined by the methods followed by Devadasan *et al.* (1978). Organoleptic evaluation was done by the method of these authors.

Table 1 gives the proximate composition of fresh ribbon fish. Table 2 presents the changes in chemical and organoleptic characteristics of block frozen ribbon fish chucks during storage at–18°C. Changes in total nitrogen were not very significant during storage upto six months. However the amount of total non-protein nitrogen registered a steady decrease. Water soluble nitrogen showed a slow decrease upto 16 weeks. Salt soluble nitrogen registered a significant decrease after 16 weeks. The same trend was noted in amino nitrogen and also in the organoleptic score. Individually wrapped and frozen chunks did not show any appreciable difference from block frozen chunks. But they had a slightly better flavour and texture compared to the block frozen products (Table 3).

The frozen storage life of minced meat was lesser compared to frozen chunks. The frozen minced meat was good upto 12 weeks, after which the quality showed slight deterioration as reflected in the chemical and organoleptic values (Table 4).

The changes in ribbon fish during freezing and storage was thus found to be similar to the changes in other marine fishes. Freezing as chunks and individually wrapped in polythene is found to be the best method for its preservation, as it retained its quality upto 16 weeks. Even after 16 weeks, the product remained acceptable upto 28 weeks, though there was some loss in its original quality. Frozen minced meat of ribbon fish was acceptable upto 12 weeks only after which it showed marked signs of deterioration.

Table 1. *Chemical composition*

Moisture %	77.67
TN %	2.81
Lipids %	0.70
Ash %	1.18
TNPN %	0.48
WSN % of TN	31.10
Alpha amino nitrogen mg/100 g	38.00

Table 2. *Changes in block frozen chunks*

	Storage in weeks						
	0	4	8	12	16	20	24
Moisture %	77.74	77.67	79.00	78.32	79.20	78.50	77.10
TN %	2.81	2.82	2.78	2.82	2.80	2.84	2.91
TNPN %	0.48	0.39	0.40	0.41	0.35	0.31	0.31
WSN % of TN	30.20	27.80	27.50	27.00	25.00	26.10	26.00
SSN % of TN	49.10	46.50	42.10	40.00	40.10	28.60	27.50
Alpha amino nitrogen mg/100 g	39.40	36.00	36.10	33.20	32.70	31.00	30.00
Organoleptic score out of 10	9	8	8	7	7	6	4

Table 3. *Changes in individually frozen chunks*

	Storage in weeks						
	0	4	8	12	16	20	24
Moisture %	77.42	76.56	78.12	77.30	78.52	78.00	78.10
TN %	3.09	2.90	2.85	2.80	2.87	2.83	2.82
TNPN %	0.47	0.43	0.41	0.38	0.32	0.32	0.31
WSN % of TN	31.10	30.80	28.70	27.70	—	26.76	26.80
SSN % of TN	48.20	40.30	39.10	42.15	41.00	30.85	29.00
Alpha amino nitrogen mg/100 g	33.30	40.50	37.40	36.50	35.50	28.00	27.80
Organoleptic score out of 10	9	9	8	8	7	5	5

Table 4. *Changes in frozen minced meat*

	Storage in weeks						
	0	4	8	12	16	20	24
Moisture %	78.92	78.10	77.52	77.20	76.32	75.92	75.15
TN %	2.83	2.92	2.87	2.76	2.84	3.00	2.81
TNPN %	0.46	0.41	0.39	0.37	0.37	0.36	0.36
WSN % of TN	29.30	27.80	25.20	26.10	—	24.60	25.10
SSN % of TN	58.50	50.35	41.10	38.80	34.60	36.80	33.00
Alpha amino nitrogen mg/100 g	35.80	34.60	32.90	28.40	25.00	24.80	25.10
Organoleptic score out of 10	9	8	7	6	5	4	4

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Veraval Research Centre of Central Institute of Fisheries Technology, Veraval-312265

**RAJENDRA BADONIA &
*K. DEVADASAN

Present Address: **Central Institute of Fisheries Education, Kakori Camp, Versova, Bombay-400 061
*Central Institute of Fisheries Technology, Cochin-682029