

FREEZE DRYING OF FISHERY PRODUCTS: PART V*

STORAGE CHARACTERISTICS OF READY-TO-SERVE FREEZE DRIED FOODS

T. K. GOVINDAN**

Central Institute of Fisheries Technology, Cochin-682011

Behaviour of freeze dried ready-to-serve fish based food preparations during prolonged storage at room temperature has been studied and reported in this paper. Storage life of such products under the conditions employed in this study can be reckoned in years at our ambient temperatures.

INTRODUCTION

The development and freeze drying of ready-to-serve foods based on fish such as fish salads, fish soup mixes and prawn cake have been described in two earlier communications (Govindan, 1969, 1970). Preparation of fish salads from prawn, seer, tuna and cullawah, fish soup mixes from seer and cullawah and a fish cake from prawn and their preservation by freeze drying have been dealt with in those papers. The present work pertains to a study of the behaviour of such products on prolonged storage at room temperature.

EXPERIMENTAL PROCEDURE

The products were prepared and freeze dried as described earlier (*op. cit.*), packed in hermetically sealed tin containers in an atmosphere of nitrogen and stored at ambient temperatures. Samples were withdrawn at intervals and analysed according to AOAC (1960) methods.

RESULTS AND DISCUSSION

Results of initial analysis of the products immediately after preparation are presented in Table I, whereas Table II summarises the changes that these products undergo during prolonged storage at room temperature.

It may be seen from Table I that the fat contents of the products are fairly high, as also the salt contents. It is well known that common salt accelerates development of rancidity in salt cured fatty fish. However, in the case of these products, they are fully protected against hydrolytic and oxidative changes by their low moisture contents and the inert atmosphere inside the containers. This fact is fully borne out by their low peroxide and free fatty acid values even after prolonged periods of storage at room temperature of the order of two years and more. Organoleptically also, the products retained

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**Present address: Central Institute of Fisheries Technology Sub-station, Kakinada-533002.

TABLE I
Initial analyses of the products.

Product	Moisture: %	Crude protein (Nx6.25)	Fat: %	NaCl: %
Prawn cake		59.65	11.57	...
Ribbon fish salad	3.432	48.05	24.00	6.471
Seer fish salad	2.927	58.51	28.78	4.240
Seer soup mix	3.536	44.54	26.81	7.164
Cullawah salad	2.086	46.64	33.29	4.810

TABLE II
Chemical changes occurring in freeze dried, ready-to-serve,
fish based foods during prolonged storage.

Product	Period of storage: months	Moisture %	Peroxide value*	Free fatty acids‡	Organoleptic quality
Prawn cake	11	1.738	2.241	...	Good
	16½	1.740	3.700	3.781	"
	21	2.828	2.363	3.832	"
	24½	3.604	6.421	2.324	"
	28	1.677	1.323	2.768	"
Ribbon fish salad	20	3.494	2.599	9.642	Good
Seer fish salad	18½	3.113	2.560	5.795	"
	26	1.645	2.905	2.448	"
Seer soup mix	13	2.302	1.946	12.72	Good
	18	2.738	0.835	9.66	"
Cullawah salad	6½	0.936	8.786	0.677	Good
	12	1.957	2.656	1.079	"
	16	1.270	1.284	1.070	"

*ml N/500 thiosulphate per g. fat.

‡% of fat as oleic acid.

their colour, appearance, crispness, texture and flavour intact throughout the periods of storage.

Hence, the ready-to-serve fish based freeze dried foods can be preserved for prolonged periods, of the order of years, provided they are packed in hermetically sealed tin containers under an inert atmosphere of nitrogen.

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