

MODE OF OCCURRENCE OF VITAMIN A IN SHARK LIVERS

WALD,^{1,2} and Hecht, Chase, Shaler and Haig³, have shown that vitamin A occurs in combination with protein in visual purple of the eye and plays an important rôle in the photochemical reactions accompanying the visual process. Lovern, Edisbury and Morton⁴ have shown that on the extraction of oil from livers by non-polar solvents—to avoid denaturation of proteins—vitamin A may still be present partly in combination with protein and partly in oil solution. Working on the distribution of vitamins A₁ and A₂ in different coats of the intestinal tube, Lovern and Morton⁵ concluded that the vitamin-protein complex may influence the transport of fatty acids from the intestines. Indirect evidence that vitamin A may partly occur as an integral part of liver tissue, has been observed during a comparative study of the processes of extraction of oil from shark livers. Shark liver containing 60 per cent. or more of oil was found to yield to the pressure exerted by its own weight a considerable quantity of oil on its keeping for a very short time after the removal of the liver from the shark. Two such individual samples of whole livers were selected for the experiments. The oil which oozed out was skimmed off and the liver treated with high pressure steam in specially fabricated steaming vats to extract the rest of the oil. The vitamin A potencies and a few chemical and physical characteristics of these fractions were then determined and compared. Vitamin A potency was assayed on the whole oil by the Carr-Price reaction using a B.D.H. pattern Lovibond Tintometer. The oil data were obtained by methods described before.⁶

Comparative data are presented in the table given below:—

TABLE I
Comparison of the two oils

Particulars	Sample I		Sample II	
	Oozed out	Steam extracted	Oozed out	Steam extracted
Weight of liver	87 lbs.		82 lbs.	
Total weight of oil	62 lbs.		60 lbs.	
Percentage yield	71.3		74.5	
Sample of oil	Oozed out	Steam extracted	Oozed out	Steam extracted
Vitamin A potency Carr-Price Value	33.2	84.9	c. 1.0	16.9
Colour	Yellow	Orange	Yellow	Orange
Refractive Index, 35° C.	1.4623	1.4635	1.4653	1.4659
Acid Value, mgm. KOH/gm.	0.45	1.1	0.5	2.6
Saponification Value	154.4	155.6	168.6	172.0
Iodine Value: Wijs	78.54	83.71	102.3	100.2

The table shows that vitamin A does not occur wholly in oil solution in shark livers;

It appears to be partly present as a complex with protein. This has some bearing on the conditions to be adopted during any oil extraction process.

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PYRETHRUM IN KASHMIR

PYRETHRUM has received considerable attention in India during recent years. Among the Provinces and Indian States who have taken up its cultivation, Kashmir leads with nearly 1,500 acres of land under Pyrethrum. A comparative study has been made of the pyrethrin content of the flower-heads collected from plantations situated at different altitudes during the past two years, to establish the optimum conditions for its collection, cultivation and drying under the local conditions. A large number of samples were collected from each individual plantation at different stages of blossoming of the flower-heads and assayed in this laboratory.

Results (Table I) indicate that the pyrethrin content tends to increase from the closed to the opened stage, but when the flowers are fully opened this percentage shows a decrease. This is obviously caused by the increase in the weight of the flower-heads which follows pollination and the subsequent formation of seed. This latter growth results in an increase of nearly 60 per cent. in the weight of flower-heads. Table I below details the results summarised above.

TABLE I

S. No.	Locality	Altitude (feet above sea-level)	Average weight of individual flower	State of Maturity	Total Pyrethrins per cent.
			Grams		
1	I	5000	0.086	Unopened	0.57
2	I	5000	0.108	Half opened	0.8
3		5000	0.161	Opened	0.9
4		5000	0.263	Fully opened	0.78
5	II	5500	0.094	Unopened	0.82
6		5500	0.108	Half opened	0.83
7		5500	0.180	Opened	0.92
8		5500	0.294	Fully opened	0.71
9	III	5500	0.086	Half opened	0.76
10		5500	0.125	Half opened	0.79
11		5500	0.195	Opened	0.91
12		5500	0.217	Fully opened	0.79