United States Department of the Interior, J. A. Krug, Secretary
Fish and Wildlife Service, Albert M. Day, Director

Fishery Leaflet 290

Washington 25, D. C. February 1948

DISTRIBUTION OF OIL AND VITAMIN A IN FISH LIVERS

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It is generally believed that there is a considerable variation in vitamin A potency from one part of a fish liver to another. Ordinarily such variation would have but little, if any, practical significance; however, when the sampling procedures used involve the taking of cores from cans of livers or clippings from the individual livers, knowledge of such variation becomes important.

Incidental to work on methods of sampling, tests were made on two soupfin shark livers. While it is realized that determinations limited to two samples are inadequate to draw any general conclusions, it is believed that the results in these two instances might be of interest.

Two livers taken at random from a five-gallon can of male soupfin shark livers were weighed and arranged with the gall section facing upward, and measurements were taken of the width and length of each lobe. Eight sections of approximately 90 grams each were cut from the livers at equal intervals as illustrated in Figures 1 and 2. These sections were placed separately in a Waring-type blender and disintegrated to apparent homogeneity. After samples had been taken for analysis, the remaining portion of the ground liver material was combined with the balance of the whole liver, and the resulting mixture was ground and sampled for analysis.

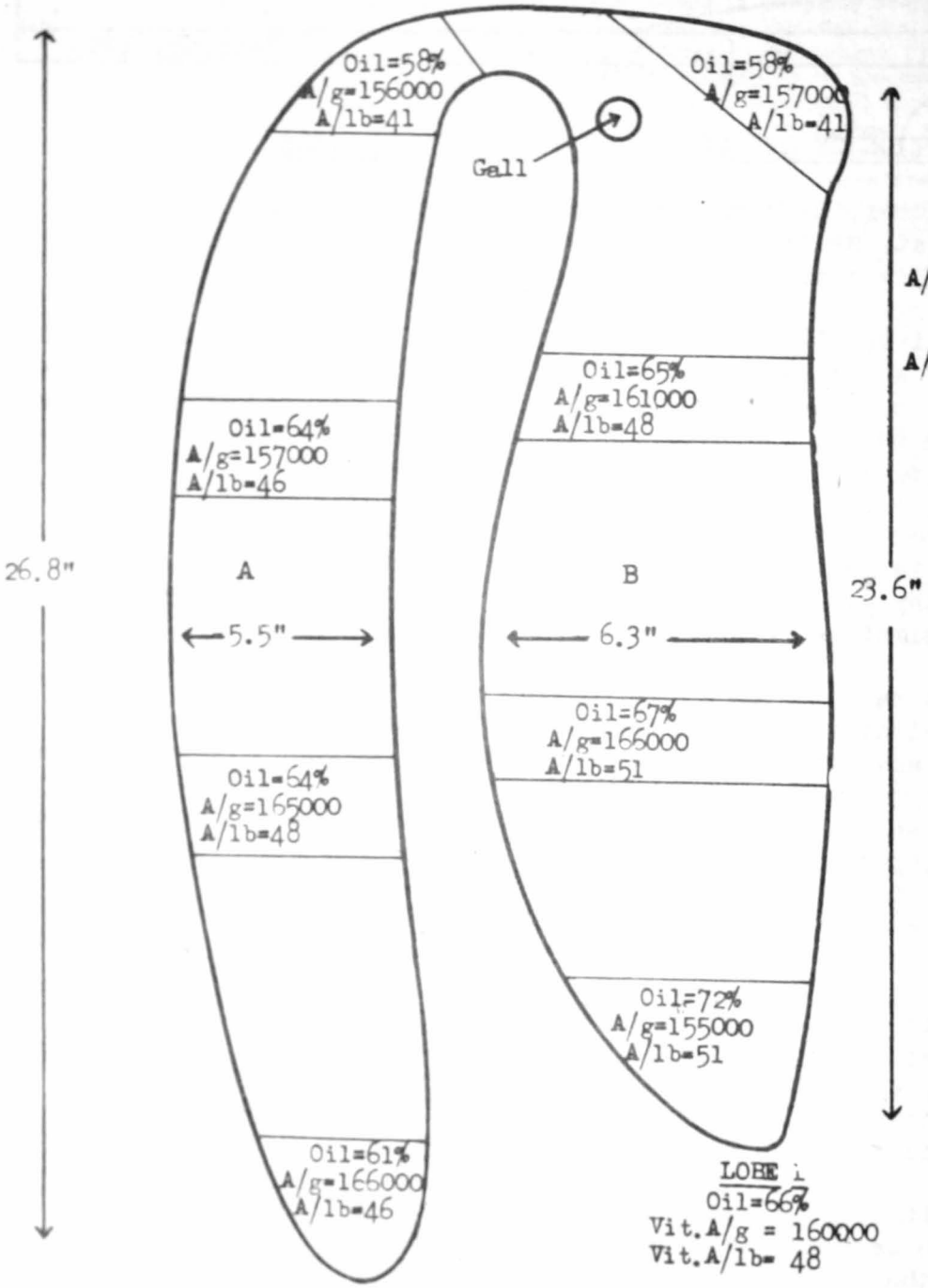
Oil was extracted by shaking the weighed samples with ethyl ether and anhydrous sodium sulfate; oil content was found by evaporating and weighing an aliquot portion. Making the measurements with a Beckman spectrophotometer, vitamin A content was estimated by determination of the extinction coefficient at 328 millimicrons of an isopropanol solution of the oil.

Although the distribution of vitamin A and oil appears somewhat uneven (Figures 1 and 2), in no case is the difference from one section to another of the same liver greater than 25 percent. Also, the two lobes compare quite closely with each other, differing by less than 10 percent. It is of interest to observe that if any one section had been taken for analysis instead of the entire liver, the relative error would not have been greater than 16 percent in any case.

Note: This leaflet supersedes Sep. 88, a reprint from Fishery Market News, January 1945, pages 6-8.

L I V E R N O. I

Species - Soupfin Sex - Male
Color - Dark Wt. - 5.3 lbs.



A/g - USP units of Vit.A per gram of oil.

A/lb- Millions of USP Units of Vit.A per lb. of liver.

LOBE A
Oil=62%
Vit.A/g = 161000
Vit.A/lb= 45

LOBE B
Oil=66%
Vit.A/g = 160000
Vit.A/lb= 48

WHOLE LIVER
Oil=62%
Vit.A/g = 159000
Vit.A/lb= 45

Figure I - Distribution of Vitamin A in a soupfin shark liver.

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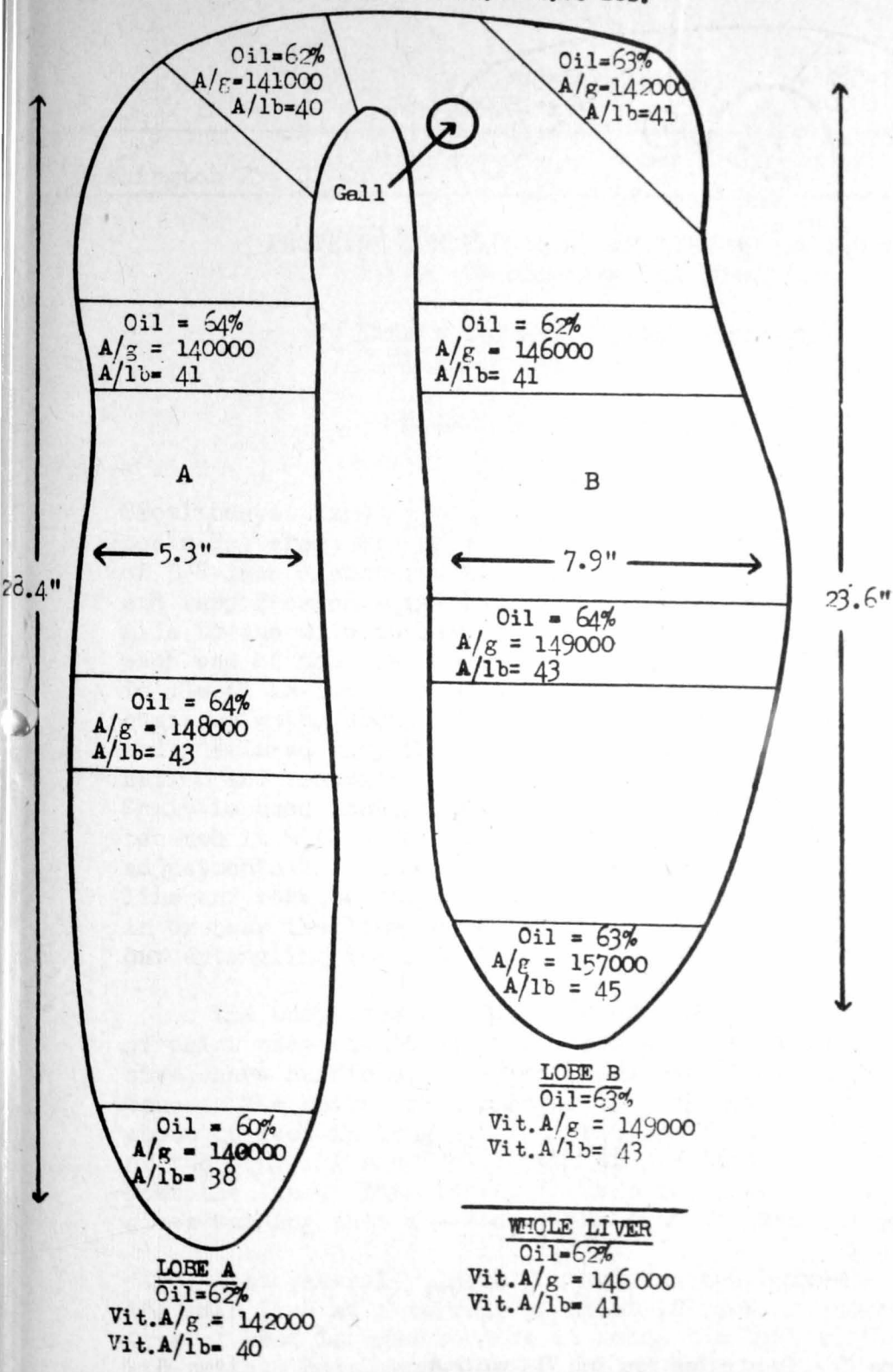
L I V E R N O. II

Species - Soupfin Sex - Male
Color - Dark Wt. - 6.08 lbs.



A/g - USP units of Vit.A per gram of oil.

A/lb- Millions of USP Units of Vit.A per lb. of liver.

LOBE A
Oil=62%
Vit.A/g = 142000
Vit.A/lb= 40

LOBE B
Oil=63%
Vit.A/g = 149000
Vit.A/lb= 43

WHOLE LIVER
Oil=62%
Vit.A/g = 146000
Vit.A/lb= 41

Figure II - Distribution of Vitamin A in a soupfin shark liver.