UTILIZATION OF SEA LIONS IN ALASKA

By John A. Dassow*

During the past year, there has been new interest shown in the possibility of commercially utilizing the Steller sea lion, which occurs in large numbers in Alaska coastal waters. Some of this interest arises from the demand for an economical meat, with high-protein and low-fat content, for use as either fur-farm or fish-hatchery feed in the Midwestern and Western states.

STELLER SEA LION

General information on the Steller sea lion is given in the following excerpt from the publication, "The Seals, Sea Lions, and Sea Otter of the Pacific Coast," by Karl W. Kenyon and Victor B. Scheffer, Wildlife Leaflet No. 344, U. S. Fish and Wildlife Service (February 1953).

"The Steller sea lion is the largest of all eared seals. Because of its massive size and 'belligerent' nature, it is seldom seen in zoos and is never trained. It is

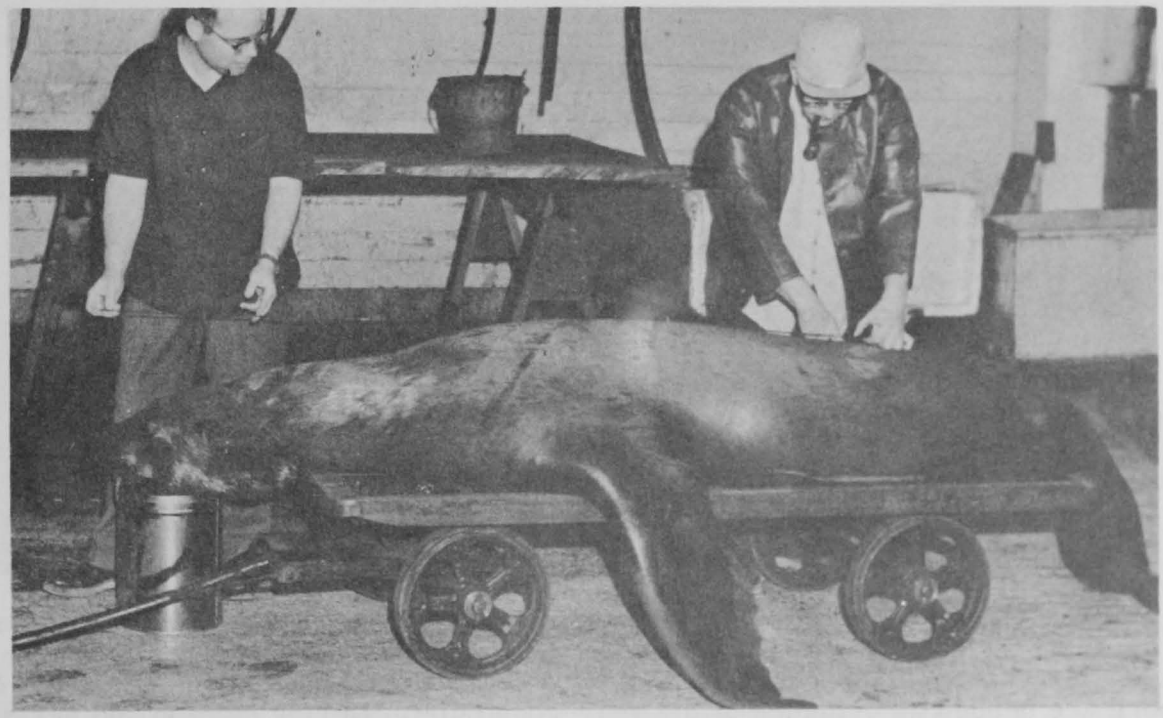

Fig. 1 - Measuring sea lion shot in Tongass Narrows--male, weight 800 pounds.

well known to fishermen through its habit of robbing fish from nets, traps, and lines and because it gathers near estuaries to feed during salmon and herring runs. It is named for Georg Wilhelm Steller, the naturalist who accompanied the discovery expedition to Alaska in 1741.

DESCRIPTION: "The adult male weighs up to 2,200 pounds and the female up to 1,000 pounds. At birth, the pup weighs about 35 pounds and is a rich chocolate brown. Within a few months it takes on the buff or yellowish-tan coat of the adult. The large size, light color, and heavy muzzle and head are the best recognition characteristics of the adults. The young of less than a year may easily be confused with the fur seal and California sea lion.

*Chief, Fishery Products Laboratory, Ketchikan, Alaska, operated jointly by the Branch of Commercial Fisheries, U. S. Fish and Wildlife Service and the Fisheries Experimental Commission in Alaska.

"The adult voice is a prolonged, deep-throated, bellowing roar; the male's somewhat lower than the female's. Both make, in addition, coughing and grunting sounds. The pup utters a feeble, prolonged grunt."

RANGE: "The Steller sea lion ranges from the islands of southern California northward along the coast into Bering Sea. The population is roughly estimated at: California 3,000; Oregon 1,000; Washington 500; British Columbia 10,000; Alaska 40,000; total about 60,000. This sea lion is usually found at sea, very rarely in bays."

BREEDING HABITS: "It breeds throughout most of its range. During June and early July the sea lions resort to favorite wave-beaten rocks and islets. Here the male holds a harem of 10 to 20 females. The cow bears a single pup and is bred before she is allowed to return to the sea to feed. The pup lives on mother's milk for at least three months. It does not take to the water for several weeks after birth, although, like the fur-seal pup, it is able to swim weakly from the moment it is born."

Fig. 2 - Butchering sea lion shot in Tongass Narrows--male, weight 800 pounds.

FEEDING HABITS: "Few Steller sea lion stomachs have been analyzed. Many more are needed as evidence of the year-round diet. During salmon and herring runs, sea lions gather in straits and at river mouths to feed. Sight observations, however, may be misleading. The stomach of a sea lion killed near the mouth of the Klamath River during a salmon run contained no salmon, but it was packed with lampreys, fish which prey extensively on salmon. Other sea lions, killed in and near fish traps, contained salmon. Yet, during much of the year, sea lions feed where no commercially-valuable fish are present. The contents of approximately 50 stomachs containing food revealed a diet of squid, sand lances, pollock, flounders, sculpin, cod, herring, small sharks, skates, perch, and various other scrap fishes; with small amounts of salmon, halibut, and sablefish."

"Many more sea lion stomachs are needed before conclusions can be drawn as to the over-all damage to the food-fish industry. Fishermen should save sea lion stomachs, either frozen or pickled in formalin, for analysis, with information as to when, where, and by whom they were taken. For further details, consult your local fishery agencies."

"Vigorous statements of the damage inflicted by sea lions to fishing are often heard. No doubt exists that in certain areas sea lions interfere materially with fishing activities. However, before any control measures can be effectively taken, fishermen should present evidence consisting of exact locations, dates, the number of animals involved and, whenever possible, the stomachs of sea lions killed. Without this specific information, a sea lion control program might represent time and money wasted, since large numbers of sea lions exist where no fishing is carried on. In order to be effective, a control program must be concentrated where damage to fishing and fisheries occurs."

REGULATIONS

The Fish and Wildlife Service regulations pertaining to sea lions are of interest to anyone planning their utilization. Under the Code of Federal Regulations (Title 50 Chapter 1-G), Part 142, "Protection of Alaska Sea Lions," was amended by the Secretary of the Interior on April 7, 1949, as follows:

"AUTHORITY: This amendment is issued pursuant to the Act of June 16, 1934 (48 Stat. 976; 16 U.S.C. 659).

"Basis and Purposes: On the basis of widespread complaints from fishermen, information produced at public hearings, written briefs submitted by members of the fishing industry, observations by personnel of the Fish and Wildlife Service, and a scientific investigation described in Special Scientific Report No. 28 of the Fish and Wildlife Service, it has been determined that sea lions occur in excessive numbers in the waters of Alaska and are inflicting serious economic loss on the fisheries. The protection of the herd at Bogaslof Island will prevent the extinction of this animal as a species of interesting sea life in such manner as will not be detrimental to the Alaskan commercial fisheries. Accordingly, to reduce the abundance of sea lions, the following provision is adopted, to become effective 30 days after its publication in the Federal Register.

"Section 142.1 is amended to read as follows:

"s 142.1 Killing of sea lions. The killing of sea lions in the Territory of Alaska, or in any of the waters of Alaska over which the United States has jurisdiction is permitted, except on Bogaslof Island and within one statute mile of the shores of Bogaslof Island."

EVALUATION OF POSSIBILITIES FOR UTILIZATION

For study of utilization possibilities, the Service's Alaska Fishery Products Laboratory obtained during November 1954 to January 1955 four specimens of the Steller sea lion from local groups in Tongass Narrows (adjacent to Ketchikan). The proximate composition of samples of meat, liver, and blubber from each animal was determined and is summarized in table. In taking samples of the meat, the blubber (fat) was trimmed carefully in order that only lean meat was analyzed. Both meat and liver were found to be high in protein (20 to 24 percent) and fairly low in oil (1 to 4 percent). The protein content compares favorably with that for horse meat and lean whale meat, both of which are used extensively in animal feeds. The liver was found to be approximately 3 percent of the total weight of the animal. Based on 2.8 percent-oil content, one sample of liver assayed 302,000 spectrophotometer units of vitamin A per pound, or 23,800 units vitamin A per gram of oil.

Both the sea lion meat and liver were found to be an acceptable human food; however, taste tests at the Laboratory and trials by staff personnel at home have shown that appetite appeal is lacking once the novelty wears off. Probably part of this is a matter of esthetic appeal. The meat is dark red and dense, being most acceptable

as a pot roast, as ground meat in burgers, or as meat balls with spaghetti. The liver is coarser and less tender than beef liver but of good flavor. It would not appear that there would be any market for sea lion meat and liver as food for humans, outside of emergency rations or as a low-cost protein food in foreign feeding programs.

Although no laboratory feeding tests have been made, sea lion meat seems to have considerable appetite appeal for cats and dogs, judging from comments of a a half-dozen local residents using it for pet feeding. The liver is equally acceptable. This suggests the possibility of marketing the frozen meat and liver in 1-pound waxed cartons for pet food.

Proximate Composition[1/] of Components of Sea Lions Obtained November 11, 1954, December 6, 1954, January 9, 1955, and January 12, 1955, near Ketchikan, Alaska

Sample	Component	Moisture	Oil	Protein	Ash
		Percent by Weight			
Sea lion No. 1 Male (Weight 800 lbs.)	Blubber	20.1	[2/] 73.4	5.5	.2
	Liver	74.2	2.8	20.8	1.1
	Meat	74.3	2.6	23.0	1.1
Sea lion No. 2 Male (Est. weight 1,000 lbs.)	Blubber	16.5	77.6	4.4	.2
	Liver	71.9	4.2	20.4	1.1
	Meat	75.0	1.4	23.8	1.1
Sea lion No. 3 Female (Weight 654 lbs.)	Blubber	11.9	83.9	4.2	.2
	Liver	74.1	3.5	19.4	1.1
	Meat	73.6	1.4	24.5	1.1
Sea lion No. 4 Male (Est. weight 800 lbs.)	Blubber	14.0	78.7	4.8	.2
	Liver	72.8	3.4	21.0	1.1
	Meat	74.0	2.1	23.0	1.3

1/ Analyses were made according to the methods of the Association of Official Agricultural Chemists, 1950. Each value reported is the average of one set of duplicate analyses. Analyses by John L. Iverson, Fisheries Experimental Commission, Fishery Products Laboratory, Ketchikan, Alaska.

2/ The analysis of this sample of sea lion blubber oil showed the following characteristics:

Iodine value	142.7	Refractive index at 25° C.	1.4726
Saponification value	190.6	Cloud point of oil	85° F.

Note: Comparative data for protein and fat content of horse meat and whalemeat: Horse meat: protein 15 percent; fat 3 percent; Whale meat, lean: protein 20 percent; fat 4 percent.
(From Food Composition Tables for International Use, Nutritional Studies No. 11, Food and Agriculture Organization, Rome Italy, March 1954).

The only information available indicates that sea lion meat is good feed for ranch fur animals, provided that excess blubber is carefully trimmed to produce a low-fat content. Controlled feeding tests would certainly be desirable before large quantities are obtained for such use. The acceptance of whale meat for fur-farm feeding would seem to indicate that sea lion meat also would be acceptable.[1/]

Another market would be as trout or salmon feed in Federal and state hatcheries. Previous surveys (1952) by this Laboratory have shown considerable need for low-cost protein feeds in fish hatcheries as a substitute for liver and horse meat, which are in limited supply and scarce on occasion. Preliminary inquiry indicates considerable interest by hatchery operators in obtaining sea lion meat at a price competitive to other feeding materials.

In regard to utilizing the balance of the sea lion carcass (the hide, viscera, bones, blubber, etc.), possibilities are present but look rather slim. The hides on tanning produce a heavy-bodied leather which can be split to make a soft durable

1/ According to the "Fishery Products Report S-226" of November 22, 1954, Market News Service, U. S. Fish and Wildlife Service, Seattle, Wash., imports of Norwegian whale meat entering the United States increased from 60,000 pounds in 1952 to more than 2,000,000 pounds in 1954. Most of it was used for animal feed, especially mink.

leather suitable for leather specialty goods--belts, handbags, jackets, and other tourist items. We have been advised on several occasions by large tanners that sea lion leather is of no commercial value because the hides have too many defects, e.g., scars and cuts. Apparently this would be no deterrent for specialty goods and tourist items which could be sold in Alaska.

Reduction of the blubber, bones, viscera, and remaining carcass to meal and oil would be practical in Alaska if (1) large quantities could be obtained--50 to 100 tons per day, for example and (2) carcasses could economically be hauled to a central reduction plant now operating. Both of these possibilities are rather slim. In the table data are given for the analysis of one sample of blubber oil as an indication of its characteristics for industrial purposes.

It is possible, of course, that a small floater reduction plant might combine operations with a refrigerated vessel which would freeze the meat and liver. The economics of this would have to be carefully studied. If existing equipment were available and idle and could be outfitted with no great investment, a trial operation might be worthwhile. The great rookeries of Southeastern Alaska, Kodiak Island, or the Alaska Peninsula would probably be good bases for a summer operation.

In conclusion, there appear to be several major problems in considering utilization of sea lions:

(1) Lack of definite information on numbers and availability of animals at central locations.

(2) Economics and practical aspects of slaughter and recovery of the large animals, either in open water adjacent to rookeries or on the rookeries.

(3) Economics of meat recovery. Estimated lean-meat recovery not over 40 to 50 percent of carcass. Necessity of trimming blubber to produce a low-fat product for animal feed.

(4) Probable necessity of using refrigerated vessel and floater reduction plant for recovering and processing, since summer herds of sea lions school in fairly isolated waters and rookeries some distance from existing cold-storage and reduction plants.

(5) Problem of hide disposal. Leather not suitable for most industrial purposes; possibility of marketing in leather specialty goods.

The most economical operation would be one in which the entire animal could be utilized, enabling the operational costs to be deducted from several products rather than one. The preparation of frozen lean meat for animal feed, the reduction of the remaining carcass to meal and oil, and the preservation and later tanning of hides for the leather specialty market appear to be the most promising possibilities at present.

LITERATURE CITED

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