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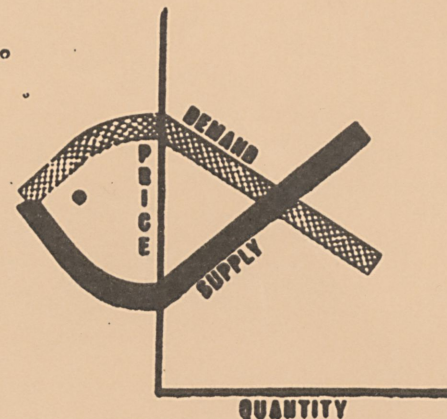
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EFFECTS OF FISHERY PRODUCT INSPECTION FEE INCREASES
ON THE UTILIZATION OF NMFS VOLUNTARY INSPECTION
SERVICES BY FISHERY PRODUCT PROCESSORS

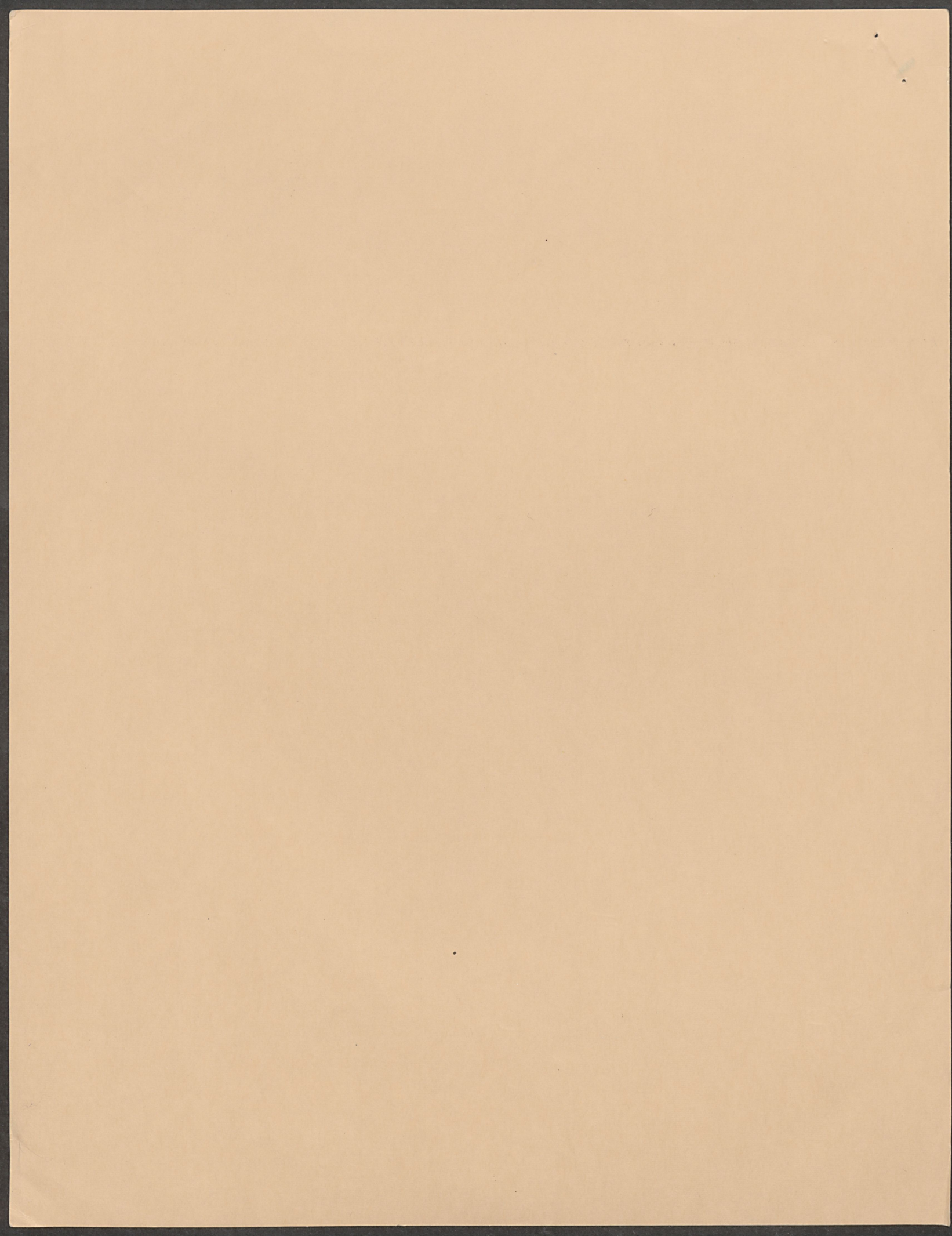
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Effect of fishery product inspection fee increases on the utilization of NMFS voluntary inspection services by fishery product processors 1/

This report analyzes the effect of various levels of fee increases on the users of the fishery product inspection service regarding the estimated number which would discontinue the service and the change in revenue from various rate increases.

It should be understood that the development of these estimates was rather subjective. There has not been, nor is there now, any significant program to obtain information on the economics of processing of fishery products. Therefore, the crucial determining feature as to whether a processor would choose to employ the service, that is, the effect of inspection services on profits, is not available. In this case other assumptions regarding the decision to use inspection services were followed to obtain the estimates herein.

While no adequate measure of profits of individual processors exists, information is available on average profits on sales of food processors (Table 1). This is compared to estimated average profits of selected fishery processors (note especially the footnote to Table 1). The table shows that profits in this industry are not high, and if correct they are on the average lower than usually considered sufficient for the business enterprises to continue operations. Since these

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Table 1.--Rate of return on investment, various classifications of food processors^{a/}

Type of Processor	Rate of return Percent
Food and kindred products	2.5
Fresh and frozen packaged fish	2.0
Canned and cured seafoods	1.7
Groundfish filleting	- .5
Fresh haddock fillets	1.4
Frozen haddock fillets	- .9
Frozen ocean perch fillets	.4
Frozen shrimp	1.8
Fresh blue crab meat	2.3

^{a/} Assuming a ratio of capital to sales 2.0.

Source: Various; full citations found in "Price Spreads for Fishery Products at Different Marketing Levels," by Erwin S. Penn, Economic Research Laboratory, National Marine Fisheries Service, NOAA, U.S. Department of Commerce (unpublished draft manuscript).

businesses do remain in operation (business failures are not abnormally high), it can be concluded that the present information on profit is not adequate to determine the dropout rate due to increased costs.

The following procedure was used to obtain the level of participation. Based on average net profit on sales by type of product, a distribution of profits was obtained by assuming a normal probability distribution.^{2/ 3/} It was further assumed that processors would not participate in the inspection program if their profits were one standard deviation or more below the average of all processors of that product. Data were obtained on the quantity of fishery products inspected per plant for all plants in the voluntary inspection program from January to October 1971 inclusive, along with the fees charged per plant. As their current inspection fee increases, profits decrease, so that a higher percent have profits more than one standard deviation below the original average. This determines the dropout rate as fees are increased. The results are shown in Tables 2 and 3. Only shrimp and stick-portion-fillet plants were included in the analysis as they account for the overwhelming majority of all fishery products inspected. Crabs, scallops, and clams are other products which are inspected with some degree of frequency.

^{2/} Penn, Erwin S., "Price Spreads for Fishery Products at Different Marketing Levels," Economic Research Laboratory, National Marine Fisheries Service, NOAA, U.S. Department of Commerce (unpublished draft manuscript).

^{3/} See any basic statistics textbook, e.g., Bernard Ostle, Statistics in Research, Iowa State College Press.

It should be pointed out that by calculating the percentage dropout, we are assuming that the volume inspected will change by small units for a small change in fee. In actuality, if a processor withdraws from the program his entire production will probably be withdrawn. With the relatively small number of participants, any change in volume inspected is likely to come in large blocks or large percents of the total.

Based on these figures it appears that the dropout rate from fee increases is not very high. In every case the rate of dropout is less than the rate of increase in fees. The reason is that, except for the smaller volume plants, inspection fees make up a small part of total costs and therefore do not have a significant affect on profits. With this general insensitivity of change in fee to change in profits, the assumptions used to obtain the results would not be expected to give greatly different answers than another (perhaps better) set of assumptions.

Tables 2 and 3 reveal the difference in effect of a given dollar change in fee costs by type of product. For example, note how from a base fee of .3¢ given percentage increases affect the dropout rate in the two product categories (compare the third column of Table 2 with the second column of Table 3). The dropout rate for shrimp is much less because net profits are higher in shrimp plants and a given change in costs will reduce profits by smaller percentages. The same thing can be seen by comparing column 2 of Table 2 with column 1 of Table 3.

Table 2.--Effect of increase in inspection fees on continued participation by shrimp plants

	<u>thous. lb. inspected per plant</u>		
	0-500	500-1,000	1,000-15,000
Cost of inspection \$/lb.	4.89	1.69	.31
No. of plants <u>a/</u>	1	3	9
	<u>% of plants dropping out <u>a/</u></u>		
<u>% fee increase</u>			
25	21.2	6.2	.8
50	47.0	13.6	1.8
75	68.2	22.0	3.4
100	79.2	31.0	4.4

a/ For the purpose of this table, plants producing both shrimp and finfish products were included in each product category.

Note: Data in this table cover the period January-October 1971.

Table 3.--Effect of increase in inspection fees on continued participation by stick, portion, and fillet plants

	<u>thous. lb. inspected per plant</u>		
	0-500	500-1,000	1,000-15,000
Cost of inspection ¢/lb.	1.26	.27	.08
No. of plants <u>a/</u>	1	18	3
	<u>% of plants dropping out a/</u>		
<u>% fee increase</u>			
25	19.7	3.3	1.0
50	44.3	7.4	2.0
75	65.4	11.5	3.0
100	77.5	16.4	4.1

a/ For the purpose of this table, plants producing both shrimp and finfish products were included in each product category.

Note: Data in this table cover the period January-October 1971.

The analysis also shows the relative affect of fee changes by size of plant. Small plants are more sensitive to fee increases because their cost per pound for inspection is much higher than for larger plants. This is because NMFS was providing at least one inspector at each participating plant regardless of size, so that per unit costs are inversely related to amount inspected. It should be noted that the inspection regulations have been changed and inspection assignments are now being made by the Fishery Products Research and Inspection Division on the basis of assigning the level of inspection effort to an establishments in accordance with the level of need as determined by several criteria.

The final determination is how increases in inspection fees affect the revenue to NMFS. Table 4 shows these changes for the various fee increases used in Tables 2 and 3. Only the two products, i.e., frozen shrimp and groundfish products (sticks, portions, and fillets), are included. Thus the total revenue shown is below the total revenue generated during the January-October 1971 period by about \$90,000. The results can be extrapolated to all plants with a fair degree of reliability.

In calculating the revenue changes, the revenue was first decreased by the percentage dropout due to the fee increase. This figure, which represents those remaining in the program, was increased by the percentage increase in fees. Except for plants having less than 500,000 pounds inspected, total revenue increases the higher the fees are raised. Again as noted earlier, the fees do not greatly affect profits so that the dropout rate is rather moderate. A fee increase of 125 percent may well

Table 4.--Revenue changes due to increases in fishery product inspection fees a/ b/

Type/size of process (thousand lbs.)	Current revenue	Revenue with fee increase			
		<u>25%</u>	<u>50%</u>	<u>75%</u>	<u>100%</u>
Shrimp under 500	16,332	16,087	12,984	9,089	6,794
Shrimp 500-1,000	38,641	45,307	50,079	52,744	53,324
Shrimp 1,000-15,000	117,112	145,219	172,506	197,978	223,918
Sticks, portions, fillets under 500	5,825	5,847	4,867	3,527	2,621
Sticks, portions, fillets 500 to 15,000	329,022	397,705	457,012	509,573	550,125
Sticks, portions, fillets over 15,000	52,996	65,583	77,904	89,961	101,646
TOTAL REVENUE	559,928	675,748	775,370	862,872	938,428
Percent revenue increase	0	21	38	54	68

a/ Taking into account the percentage dropout in participation shown in Tables 2 and 3 and the stated percent fee increase for the remainder.

b/ In generating this table, two-thirds of the production from plants processing both shrimp and finish products were allocated to finfish products and one-third to shrimp.

cause a revenue decrease for the mid-size category of each product. Since a large proportion of the total revenue is generated in this size category, the total revenue could begin to decrease.

It should not be constructed that an immediate increase to that level is recommended, as total revenue to NMFS is not the sole criterion of optimum fee levels for the inspection service.



