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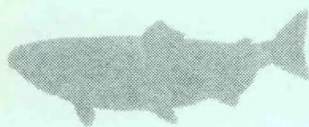
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ECONOMIC STATUS OF THE CALIFORNIA DUNGENESS CRAB FISHERY IN 1986-87

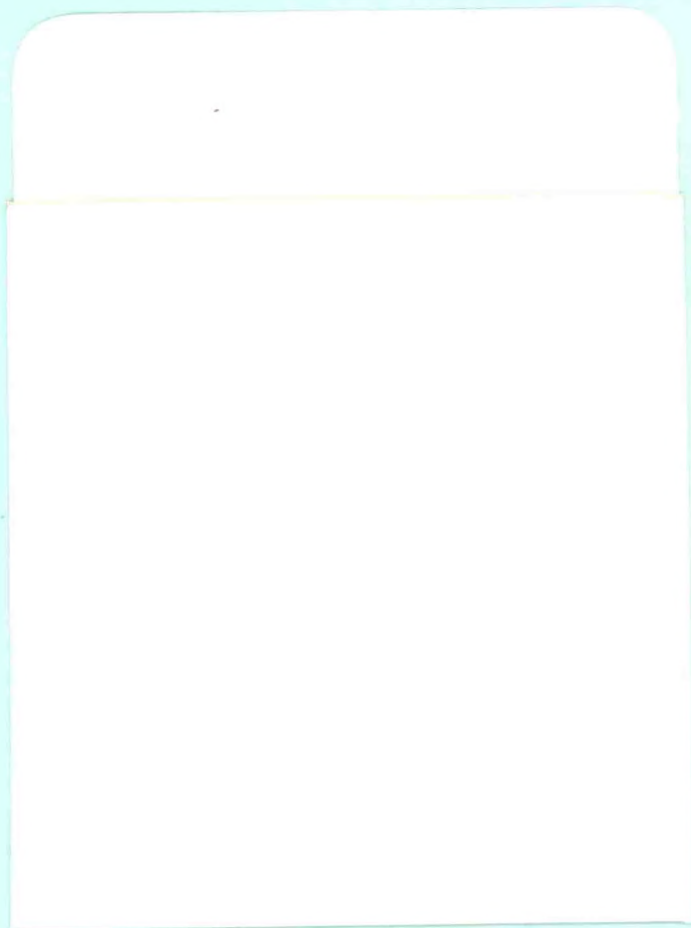
James J. Morgan
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SEPTEMBER 1989

ADMINISTRATIVE REPORT SWR-89-03

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**ECONOMIC STATUS OF THE
CALIFORNIA DUNGENESS CRAB FISHERY IN 1986-87**

James J. Morgan
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September 1989

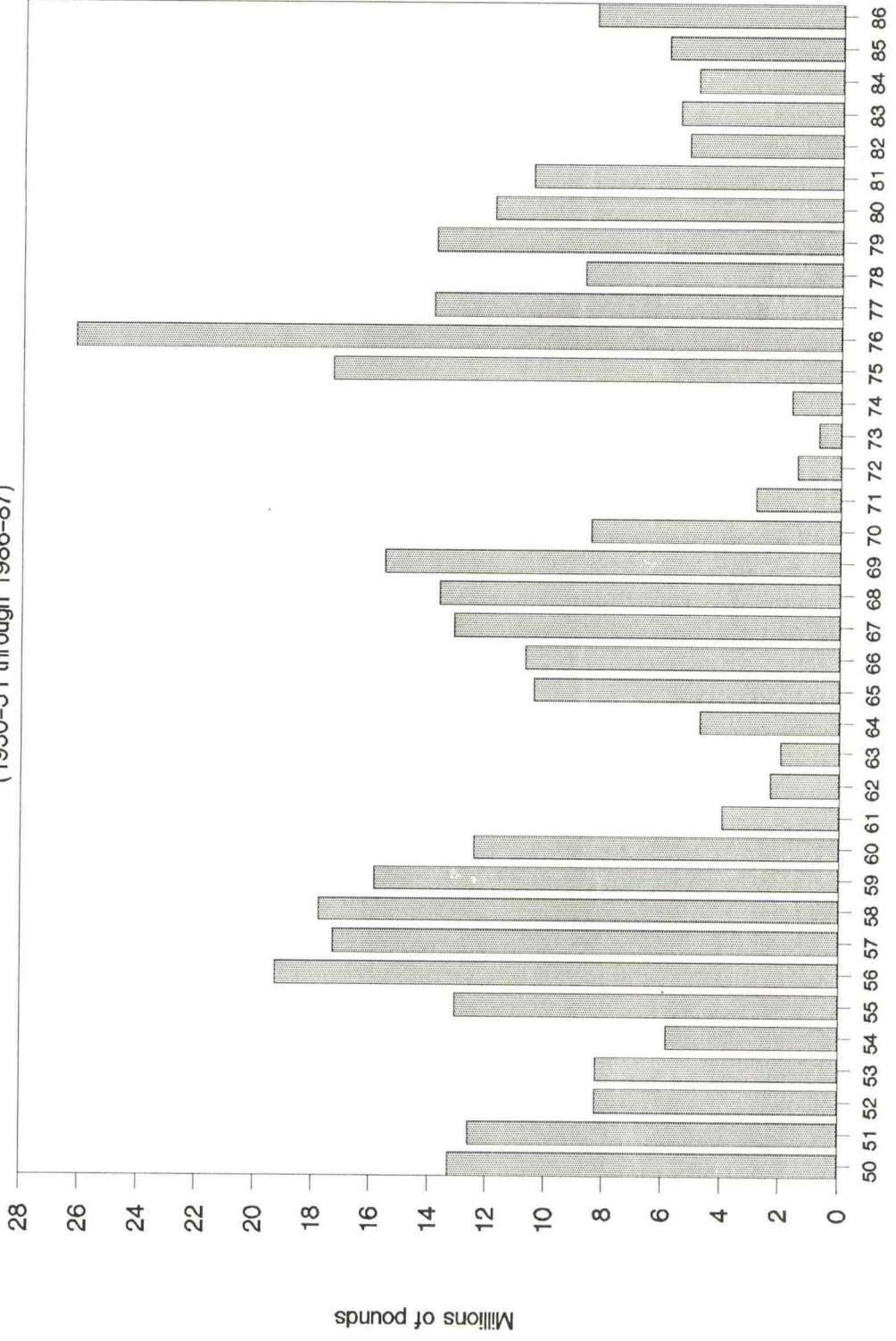
EXECUTIVE SUMMARY

To obtain an understanding of the success of the California Dungeness crab fishery during the 1986-87 fishing season, landings, exvessel value of landings, number of participating vessels, and the landings per vessel were compared to previous years. Although total landings along the Pacific Coast from Alaska to California increased slightly from the previous year, California landings increased dramatically, and, in the San Francisco area, spectacular increases occurred, apparently due to a strong year class of crabs in that area.

A total of 8,390,000 pounds of Dungeness crab were landed in California during the 1986-87 season, valued at \$12,098,000. The 1986-87 landings were the largest since the 1981-82 season. A total of 665 pot vessels landed crab, 57 more vessels than during the 1985-86 season. Pounds landed per vessel were 12,595, up 32.6 percent from the 1985-86 season. The average value of landings increased for all classes of vessels an average of 41.9 percent.

California Landings of Dungeness Crab

(1950-51 through 1986-87)



Season (Beginning in December)

Figure 1. Seasonal Dungeness crab landings, beginning in December of each year.

ECONOMIC STATUS OF THE CALIFORNIA DUNGENESS CRAB FISHERY IN 1986-87

This report on the economic status of the California Dungeness crab (Cancer magister) fishery reviews the 1986-87 crab season and compares it to the 1985-86 season and to the average season from 1981-82 to 1985-86.

I. OVERVIEW

The Dungeness crab catch along the entire West Coast during the 1986-87 season rose slightly above the level of the 1985-86 season. Landings in California, Oregon, Washington, and Alaska were an estimated 25.2 million pounds, up 11 percent from the 1985-86 season, but 9 percent below the recent five-year average (Table 1). In California, however, Dungeness crab landings were higher than any time since the 1981-82 season, up 42 percent from the catch in 1985-86, to 8,390,000 pounds. The increase in landings was especially dramatic in the San Francisco statistical area, where landings rose 317 percent, to 1,600,000 pounds, far above the fourteen-year high of 857,000 pounds landed during the 1983-84 season. The Eureka statistical area landings increased by 23 percent in 1986-87 (Table 2). Average landings of Dungeness crab in California over the last five years total 6.6 million pounds. Average landings from the 1950-51 season through the 1986-87 season total 9.9 million pounds (Fig. 1).

A total of 665 vessels using pot gear landed Dungeness crab in California in the 1986-87 season, up from 608 vessels in the previous season. The number of vessels making landings between 10,000 pounds and 19,999 pounds in 1986-87 increased by 26 percent. The number of vessels making landings of 20,000 pounds or more increased by 34 percent (Table 3).

The fishing season in northern California (north of Point Arena) opened December 1 and closed July 15. The season south of Point Arena opened on the second Tuesday of November, and closed on June 30.

II. CALIFORNIA COMMERCIAL CRAB FLEET

This section provides information on factors affecting the financial performance of the vessels that used crab pots to land Dungeness crab in California during the 1986-87 season. Small amounts of crab are landed each year by bottom trawlers, which are allowed up to 500 pounds of crab per trip, but the amounts are an insignificant contribution to the revenue of trawlers and to total crab landings; therefore, trawlers are excluded from this analysis.

A comprehensive picture of how the California crab fleet is performing financially cannot be presented without analyzing costs, earnings, and cash flows accruing from the full range of vessel activities. As in past years, cost data are not available; however, fishing revenue for California crab vessels operating in more than one state can be determined from the Pacific Coast Fishery Information Network Research Data Base (RDB). The RDB is a merged file of fish ticket data from the States of California, Oregon, and Washington. In this section the RDB has been used for (1) estimating crab landings and exvessel value for the California crab fleet, which is defined as all vessels using crab pots to land any amount of Dungeness crab in California, and (2) producing an indicator of crab fleet performance based on gross revenue accruing from marine fish landings by the California crab fleet in California, Oregon, and Washington (West Coast). This is an improvement over past reports, which relied on revenue only from Dungeness crab landings in California. The landings data provided in this section differ from Table 1 for two reasons: one, the Pacific Marine Fisheries Commission data are preliminary, and two, fish tickets that did not contain a vessel identification number could not be used in this analysis because landings had to be matched to individual vessels.

A total of 665 pot vessels made one or more landings of Dungeness crab in California during the 1986-87 fishing season, compared to 608 vessels in 1985-86. In both seasons over 60 percent of the pot fleet landed less than 10,000 pounds each of Dungeness crab, as indicated in Table 3.

Total California landings of crab by pot vessels rose from 5,763,900 pounds in the 1985-86 season, to 8,375,900 pounds in 1986-87 (Table 4). Pounds landed per vessel rose 32.6 percent, from 9,495 in 1985-86 to 12,595 in 1986-87.

The total exvessel value of the 1986-87 California Dungeness crab landings is estimated to be \$12,098,000. This is 48 percent above the estimated 1985-86 value of \$8,169,000. The average exvessel price was \$1.44 per pound in 1986-87 compared to \$1.42 per pound in 1985-86. Revenue per vessel from crab landings in California rose 35.4 percent, from \$13,436 in 1985-86 to \$18,192 in 1986-87. Adjusted for inflation, the real value of crab landings per pot vessel increased by 31.9 percent from 1985-86 to 1986-87. Average pounds landed by vessel class and average value of the catch by vessel class are shown in Table 5.

Most crab fishing in California is finished by late winter. As a consequence, crab boats generally participate extensively in other fisheries, especially salmon and albacore. These complementary fisheries often produce more revenue for crab boats than do crab. To obtain some understanding about the influence of other species on the economic status of vessels that fish

crab, we examined the west coast landings of the California crab fleet for calendar year 1986 and 1987. The review involved 599 vessels in 1986 and 577 vessels in 1987. For example, of the 665 vessels that landed crab in California during the 1986-87 crab season, 577 of those vessels landed crab only in 1987. Those 577 vessels were then examined for their landings of all West Coast marine fish in calendar year 1987.

Table 6 shows the distribution of crab vessels in 1986 and 1987 in relation to their primary source of gross revenue. The table shows that in some years a substantial number of boats may derive more revenue from a resource like salmon than from crab. In 1987 for example, 23 percent of the vessels derived more income from species other than crab or salmon. This does not mean, however, that a species like albacore did not comprise a significant portion of revenue for crab vessels. The table shows only the primary source of revenue.

Table 7 shows how the crab fleet is distributed according to the amount of revenue earned from all marine fish landed in 1986 and 1987. A larger proportion of the vessels (17 percent) earned over \$100,000 in gross revenue than in 1986 (12 percent).

The California Dungeness crab catch has been gradually increasing since the 1984-85 season. If the pattern since the 1950-51 season persists, then catches should approach or exceed the average of 9.9 million pounds in the near future. However, since the causes of the wide fluctuations in crab abundance are not fully understood, it is impossible to make predictions with any degree of confidence.

III. CALIFORNIA PROCESSORS AND MARKET CONDITIONS

Dungeness crab is sold whole (either live or cooked), as meat only, and as sections. Whole Dungeness crab is a unique product with no close substitutes. However, when sold as meat, it competes directly with Alaskan king and tanner crab in West Coast restaurants and retail seafood outlets.

The supply of Dungeness crab in the United States is determined by the catch in Alaska, Washington, Oregon, and California. Frozen crab may be inventoried with a shelf life sufficient to modify the flow of product that reaches the consumer, but not sufficient to prevent a strong seasonal pattern in wholesale prices and retail sales (Proctor, 1980).

The demand for Dungeness crab meat is affected by the supply of king crab and tanner crab caught off Alaska. The Alaska landings of king and tanner crab increased slightly in 1986-87; therefore, there was an increase in the combined supply of these two species in international and domestic markets from 1985-86 to 1986-87 (Table 8).

In recent years, the majority of the landed weight of Dungeness crab in California, Oregon, and Washington has been processed and sold as cooked meat. Most of the rest has been sold as whole crab. There were no substantial changes in this pattern during 1987 (Tables 9&10). Wholesale prices (processor level) for whole and sectioned crab increased in 1987 while the price of meat dropped.

REFERENCES

Pacific Fishery Management Council. 1979. Draft fishery management plan for the Dungeness crab fishery off Washington, Oregon, and California, 93 p.

Pacific Marine Fisheries Commission. Annual reports through 1988.

Proctor, R. 1980. 1978 west coast summaries of common product forms for Dungeness crab, pink shrimp and west coast groundfish. PFMC, 105 p.

Pacific Fishing Yearbook. 1988. Vol. IX, No. 4, pp. 119 and 121.

Table 1. United States Dungeness crab landings (thousands of pounds) from 1977-78 to 1986-87.

<u>Season</u>	<u>California</u>	<u>Oregon</u>	<u>Washington</u>	<u>Alaska</u>	<u>Total</u>
1977-78	13,800	10,375	9,237	7,169	40,581
1978-79	8,300	16,352	10,362	6,334	41,348
1979-80	14,853	18,277	8,320	5,912	47,362
1980-81	12,717	9,529	4,494	15,109	41,849
1981-82	10,786	8,700	3,928	15,811	39,225
1982-83	5,413	4,100	5,237	11,801	26,551
1983-84	5,854	4,700	6,166	9,967	26,687
1984-85	5,248	4,900	4,266	9,180	23,594
1985-86	5,920	7,100	3,900	5,800	22,720
1981-82 to 1985-86 average	6,644	5,900	4,699	10,512	27,755
1986-87	8,400	4,700	3,200	8,900	25,200

Source. Pacific Marine Fisheries Commission Annual Reports through 1987.

Table 2. Dungeness crab landings in northern and central California.

<u>Season</u>	<u>Pounds Landed</u>	
	<u>Northern California</u>	<u>Central California</u>
1977-78	13,341,000	589,000
1978-79	7,989,000	760,000
1979-80	13,199,000	661,000
1980-81	11,333,000	513,000
1981-82	10,338,000	207,000
1982-83	4,671,000	558,000
1983-84	4,679,000	857,000
1984-85	4,327,000	600,000
1985-86	5,540,000	384,000
1981-82 to 1985-86 average	7,978,600	521,200
1986-87	6,790,000	1,600,000

Source. Pacific Marine Fisheries Commission Annual Reports through 1988. Fort Bragg is the dividing line between northern and central California.

Table 3 - Distribution of vessels by pounds landed and exvessel value of Dungeness crab for pot vessels landing in California during the 1985-86 and 1986-87 seasons.

<u>Pounds</u>	<u>Vessels</u>	
	<u>1985-86</u>	<u>1986-87</u>
0 - 999	235	230
1,000 - 4,999	130	124
5,000 - 9,999	69	69
10,000 - 14,999	34	53
15,000 - 19,999	35	34
20,000 - 29,999	45	56
30,000 - 39,999	25	40
40,000 - 49,999	21	23
>49,999	<u>14</u> 608	<u>22</u> 665

<u>Value (\$)</u>	<u>1985-86</u>	<u>1986-87</u>
0 - 999	200	196
1,000 - 4,999	130	131
5,000 - 9,999	58	58
10,000 - 19,999	73	76
20,000 - 29,999	58	55
30,000 - 39,999	28	39
40,000 - 49,999	18	37
50,000 - 74,999	30	43
>74,999	<u>13</u> 608	<u>30</u> 665

Source: California Department of Fish and Game, Fish Ticket Data

Table 4 - Exvessel value and average weighted price of Dungeness crab landings in California from the 1981-82 season to the 1986-87 season.

<u>Year</u>	<u>Landings</u>	<u>Average Price per Pound</u>	<u>Nominal Exvessel Value</u>	<u>Real¹ Exvessel Value</u>
1981-82	10,525,700	0.94	9,870,000	N/A
1982-83	5,326,900	0.91	4,871,000	6,496,000
1983-84	5,651,200	1.63	9,220,800	10,076,000
1984-85	5,086,200	1.57	8,008,200	8,436,000
1985-86	5,763,900	1.42	8,169,000	8,341,000
1986-87	8,375,900	1.44	12,098,000	12,030,000

Source: 1981-82 through 1982-83 landings, California Department of Fish and Game. Unpublished Preliminary Monthly Fish Landings by Region.

1981-82 through 1982-83 value data estimated from CDFG monthly landings and exvessel prices obtained from Market News Office, Southwest Region, NMFS

1983-84 through 1984-85 landings and value, CDFG, Fish Ticket Data.

1985-86 through 1986-87 data from PACFIN Research Data Base.

¹Adjusted for inflation using the GNP implicit price deflator (1986 = 1.00).

Table 5 - Breakdown of Dungeness crab landings and exvessel value by length-class of vessel for the 1985-86 and 1986-87 seasons.

<u>Length (feet)</u>	<u>Number</u>		<u>Average Pounds</u>		<u>Average Value(\$)</u>	
	<u>85-86</u>	<u>86-87</u>	<u>85-86</u>	<u>86-87</u>	<u>85-86</u>	<u>86-87</u>
< 30	161	208	3,214	3,137	4,655	4,678
30 - 39	258	263	7,654	11,250	11,126	16,642
40 - 49	140	129	16,315	22,635	23,055	32,966
50 - 59	28	43	22,303	26,568	30,372	36,882
60 - 69	14	13	15,901	33,743	20,998	44,759
> 70	6	9	23,383	29,282	29,487	36,376
	—	—	—	—	—	—
Total	607 ¹	665				

Source: PACFIN Research Data Base

¹Characteristics for one vessel are missing.

Table 6. Primary source of revenue from all west coast marine fish landings in calendar years 1986 and 1987 for vessels comprising the seasonal California Dungeness crab fleet in 1985-86 and 1986-87

<u>Principal Species</u>	<u>1986</u>	<u>Number of Vessels</u>		<u>Percent</u>
		<u>Percent</u>	<u>1987</u>	
Dungeness Crab	267	44.57	197	34.14
Salmon	199	33.22	245	42.46
Shrimp	34	5.68	44	7.63
Halibut/Flatfish	43	7.18	35	6.07
Rockfish	16	2.67	18	3.12
Herring	19	3.17	9	1.56
Other	<u>21</u>	3.51	<u>29</u>	5.02
	599		577	

Source: PACFIN Research Data Base

Table 7. Distribution of total exvessel value of west coast marine fish landings in calendar years 1986 and 1987 for vessels comprising the seasonal California Dungeness crab fleet in 1985-86 and 1986-87

Exvessel Value (1,000 \$)	Number of Vessels	
	<u>1986</u>	<u>1987</u>
0-10	169	135
10-20	69	68
20-40	125	118
40-60	95	80
60-80	40	47
80-100	27	30
100-150	33	44
150-200	13	19
200-250	9	17
>250	<u>19</u>	<u>19</u>
	599	577

Source: PACFIN Research Data Base

Table 8. West Coast and Alaska landings (million pounds) of king and tanner crab, calendar years 1977 through 1987.

<u>Year</u>	<u>King Crab</u>	<u>Tanner Crab</u>
1977	99.6	98.5
1978	122.9	129.8
1979	154.3	132.7
1980	187.8	122.1
1981	89.9	101.2
1982	40.2	72.0
1983	28.0	62.8
1984	18.9	50.5
1985	16.5	87.9
1986	25.9	110.0
1987	29.1	113.9

Source. Pacific Fishing, 1988 Yearbook, Vol. IX, No. 4

Table 9. Quantity and value of Dungeness crab processed in Washington, Oregon, and California, 1980 to 1987.

	Units (millions)	Product Form			Total (\$)
		whole	meat	legs and sections	
1980	pounds	10.2	3.3	0.33	26.0
	dollars	10.6	14.2	1.2	
1981	pounds	5.6	3.9	0.13	29.9
	dollars	7.3	22.2	0.35	
1982	pounds	3.8	3.6	0.46	29.3
	dollars	5.3	22.9	1.1	
1983	pounds	4.3	2.8	0.81	30.8
	dollars	7.8	20.1	2.9	
1984	pounds	3.4	2.4	0.72	31.4
	dollars	8.3	20.2	3.0	
1985	pounds	2.7	2.3	0.44	26.5
	dollars	5.7	19.2	1.6	
1986	pounds	3.7	2.6	1.4	30.0
	dollars	8.0	18.1	3.9	
1987	pounds	3.4	2.0	0.54	23.2
	dollars	7.8	13.5	1.9	

Source. Processed Fishery Products, Annual Summaries, 1980-85. National Marine Fisheries Service. 1987 data are preliminary.

Table 10. Average price per pound and percent of revenue by product form of Dungeness crab processed in Washington, Oregon, and California, 1980-87.

<u>Year</u>	<u>Units</u>	<u>Product Form</u>		
		<u>whole</u>	<u>meat</u>	<u>legs and sections</u>
1980	dollars/pound	1.046	4.350	3.502
	percent	40.9	54.7	4.4
1981	dollars/pound	1.292	5.658	2.727
	percent	24.4	74.4	1.2
1982	dollars/pound	1.366	6.430	2.402
	percent	17.9	78.3	3.8
1983	dollars/pound	1.838	7.077	3.590
	percent	25.4	65.2	9.4
1984	dollars/pound	2.457	8.300	4.101
	percent	26.2	64.3	9.4
1985	dollars/pound	2.135	8.317	3.624
	percent	21.5	72.4	6.1
1986	dollars/pound	2.160	7.086	2.856
	percent	26.6	60.4	13.0
1987	dollars/pound	2.283	6.626	3.553
	percent	33.5	58.2	8.2