PACKER FEEDING OF CATTLE

its volume and significance

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CONTENTS

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I. INTRODUCTION

The growth in livestock feeding by meat packers has been an important development in the livestock and meat industry. To many livestock feeders and producers, packer feeding has been an object of particular interest and, sometimes, of concern.

Farmers see. an upward trend in packer feeding as a shift of livestock feeding out of traditional agricultural enterprise into a vertically integrated, industrial production process. They have already seen virtually all of the broiler production and more than half of the turkey production move under the ownership or control of non-farm firms.

Farmers are also fearful of the possible disappearance of the market-price system which permits free and open access to market outlets by independent producers. The price system still serves as the basic mechanism of providing rewards and incentives for livestock producers.

Farmers are also concerned about packers operating in a dual capacity, of both feeders and buyers of fed cattle. They are concerned about the extent to which packers may use their own feedlot supplies as a price hedge, or as a device to depress prices as they negotiate for additional animals in the market place. They believe that packer feeding places packers in an exceptionally strong bargaining position when they buy their additional slaughter requirements in the open market.

Some, however, have contended that packer feeding can contribute to efficiency in the slaughtering operation, by providing a source of regular slaughter supplies on Monday mornings before market supplies can be obtained, or by countering seasonally short supplies in certain areas.

The objectives of this study are to indicate the scope of packer feeding of cattle and to visualize its possible market significance.

The study covers growth trends and locational patterns for packer feeding of cattle.[1] A statistical analysis is made of packer feeding by an individual packer at one of the major terminal markets in order to determine any significant price effects. The results of the analysis are interpreted on the basis of demand and supply theory for pricing in local markets.

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[1] Livestock may be fed by packers in their own feedlots or in commercial feedlots on a custom basis. In addition to feeding by or for packing firms as such, livestock on feed may be controlled to a degree by meat packers when they are fed by owners, officers, employees, subsidiaries, and other interests associated with packing firms. Livestock fed by interests associated with packing firms in many cases may be only a limited form of vertical integration.

Contract purchasing of livestock for future delivery, and feeding incidental to holding livestock for slaughter, are not included as packer feeding for purposes of this study.

II.   THE SCOPE OF PACKER FEEDING

Packer feeding of cattle trended upward between 1954 and 1965. The number of firms increased moderately and the volume more than doubled.

Data are lacking on packer feeding before 1954. Since 1954, packers (including slaughtering food chains) have been required to report on their livestock feeding activities to the Packers and Stockyards Division of USDA's Consumer and Marketing Service, acting under authority of the Packers and Stockyards Act.

Annual reports of packers filed with the P&S Division include information on the number of each specie of livestock fed by packers and certain other information relating to feeding operations.[1] Numbers of cattle[2] fed annually by packers have been summarized for purposes of measuring trends and determining the location of packer feeding.

National Trends

Number of Packers Feeding Cattle

The number of packers feeding cattle between 1954 and 1965 ranged from a low of 151 in 1957 to a high of 215 in 1962 (Table 1). The number of firms declined between 1954 and 1957 (165 to 151) after the Korean conflict. Since that time, the number generally has increased. There were 202 packers feeding cattle in 1965.

About 1,250 packing firms slaughtered cattle commercially in the United States in 1965.[3] About 16 percent, or one-sixth, of these commercial slaughterers fed cattle in 1965.

A higher percentage of federally inspected cattle slaughtering firms feed cattle than other commercial cattle slaughterers. There were about 390 federally inspected slaughterers in 1964.[4] Of the 190 packers feeding cattle in 1964, 91 were federally inspected. Therefore, about one-fourth of the federally inspected cattle slaughterers are engaged in packer feeding. These 91 slaughterers accounted for about 45 percent of total commercial cattle slaughter in 1964 but about 85 percent of packer feeding (more than 900,000 head).

Number of Cattle Fed by Packers

During the mid-1950's, packer feeding of cattle ranged between 500,000 and 600,000 head annually (Table 1). Since that time, it has trended upward to a high of over 1.28 million head in 1965.

The best single indicator of the volume of packer feeding is the number of packer-fed cattle expressed as a percentage of total fed marketings. Total marketings of fed cattle have been estimated for the period from 1954 through 1965 for 39 leading cattle feeding states. The number has trended upward almost continuously from about 9.5 million head in 1954 to more than 17.8 million in 1965 (Table 1).

Packer feeding of cattle accounted for 6.0 percent of fed marketings in 1954, but had declined to 4.6 percent by 1956. Since 1956, packer feeding--as a percent of fed marketings--has increased irregularly with a high of 7.4 percent in 1963. The figure for 1965 was 7.2 percent.

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[1] Feeding by packer-associated interests such as owners, officers, directors, employees, subsidiaries, and affiliates of packers is not included in packer feeding recorded in annual reports. The reports, however, do cover feeding of packer-owned cattle by others under contract as well as that in feedlots owned by packers.

[2] Throughout the report, reference is made only to fed marketings and packer feeding of cattle. Calves are included in each case, unless stated to the contrary.

[3] The total number of packers slaughtering cattle is based on annual reports filed with the Packers and Stockyards Division. A reporting packer is considered a cattle slaughterer if it purchases more than 1,000 head of cattle, including calves for slaughter.

[4] Marketing Economics Division, ERS, USDA.

TABLE 1.--Number of packers feeding cattle and number of head fed compared with total fed marketings of cattle in 39 States, 1954-1965

Year	Number of packers feeding	Number of cattle fed by packers [1]	Fed cattle marketings in 39 States [2]	Packer feeding as percent of fed marketings
		1,000 head	1,000 head	Percent
1954	165	564.9	9,482	6.0
1955	161	545.8	10,762	5.1
1956	157	520.8	11,331	4.6
1957	151	557.6	11,285	4.9
1958	176	729.1	11,787	6.2
1959	157	617.0	12,843	4.8
1960	165	856.7	13,346	6.4
1961	206	919.2	14,159	6.5
1962	215	981.4	14,752	6.7
1963	211	1,175.6	15,830	7.4
1964	190	1,126.8	17,295	6.5
1965 [3]	202	1,281.1	17,850	7.2

[1] The number of cattle (including calves) fed by meat packers was summarized from annual reports of packers filed with the Packers and Stockyards Division, C&MS, USDA. Feeding by packer-associated interests is not included. Packer feeding is reported on a fiscal year basis. The majority of packers report on a calendar year basis or a fiscal year ending October 30.

[2] Economic Research Service, USDA, Livestock and Meat Situation, October 1965 issue. Estimates for 39 States are on a calendar year basis and account for most fed cattle (and calf) marketings in the U.S. The estimates for 1954 and 1965 were not available from this source. The figure for 1954 was based on earlier data published by the USDA. See, Breimyer, Harold F., Demand and Prices for Meat, Technical Bulletin No. 1253, ERS, USDA, p. 37. The figure for 1965 was obtained from Supplement No. 1 to Technical Study No. 1, National Commission on Food Marketing, June 1966, p. 8.

[3] Annual reports have not been filed by all packers for the 1965 reporting year.

In summary, there has been a trend toward increased cattle feeding by packing firms, beginning about 1957. Since 1960, it has involved about one-sixth of the commercial cattle slaughtering firms in the United States, about one-fourth of the federally inspected cattle slaughterers, and more than 6.0 percent of fed marketings.

A special survey conducted by the P&S Division in 1962 indicated that packer-associated interests fed 351,000 head of cattle in 1961. This figure is in addition to the 919,000 head reported as fed by packers only in 1961. The combined total was more than 1.25 million head in 1961 or 9.0 percent of fed marketings, compared with the 6.5 percent fed by packers only.

A second survey of cattle feeding by packer-associated interests indicated that they fed about 768,000 head of cattle in 1965. This feeding along with the 1.28 million head fed by packing firms, totaled about 2.0 million head in 1965. This amounted to 11.5 percent of fed marketings in 39 states. In other words, more than one out of every ten cattle fed in the United States is fed by a meat packer or a packer-associated interest.

Location of Packer Feeding

Although packer feeding accounts for only 7 percent of fed marketings nationally (over 11 percent if feeding by packer-associated interests is included), the percentage varies considerably by States and regions. The relative importance of packer feeding, including that by packer-associated interests, and total fed marketings in 1965 is shown for 32 leading cattle feeding States in Figure 1 and Table 2.[5]

The West is the leading region in packer feeding. It accounts for more than one-half of the United States total (60 percent in 1965). Although much of the packer feeding is in the West, the region accounts for less than one-third of the total fed cattle marketed in the United States. Nearly all the remaining packer feeding is accounted for in the 12 North Central States and eight Southern States. The North Central region, the primary cattle feeding area, with nearly 60 percent of total cattle feeding, had about 16 percent of total packer feeding in 1965. The eight Southern States accounted for about 11 percent of fed marketings and 20 percent of packer feeding in 1965.

Packer feeding makes up a much higher percentage of fed cattle marketed in the West and South than in the North Central region. In 1965, packer feeding was 22.9 percent of fed marketings in the Western States and 20.5 percent in the eight Southern States, while only 3.3 percent in the North Central region.

California is by far the leading State in packer feeding, totaling more than 588,000 head there in 1965, or 25.8 percent of fed marketings. Nearly one-half of the packer feeding in California is by packer-associated interests (278,000 head in 1965).

Colorado ranks second in packer feeding of cattle. More than one-quarter million head were fed in 1965, most by packer-associated interests (about 200,000 head). The addition of feeding by associated interests to feeding by packing firms substantially increases the percentage of fed marketings accounted for by packer feeding in Colorado (from 5.9 to 23.5 percent in 1965).

Other leading Western States in packer feeding in 1965 were Washington (110,000 head for 36.1 percent of fed marketings) and Arizona (94,000 head for 14.5 percent of fed marketings).

Texas ranked third in packer feeding in 1965 with 200,000 head (18.3 percent of fed marketings in the State). Of this, packer-associated interests accounted for only about 25,000 head. This is in contrast with Colorado and California where feeding by such interests is relatively more important.

Most of the packer feeding in the North Central region takes place in Kansas, Nebraska, Iowa, and Illinois. Of these, Kansas had the highest percentage of packer feeding in 1965 (15.2 percent of fed marketings).

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[5] Estimates of fed marketings of cattle are not available for the remaining states.

PACKER FEEDING* AND FED CATTLE MARKETINGS, 1965

PACKER FEEDING

OTHER FED MARKETINGS
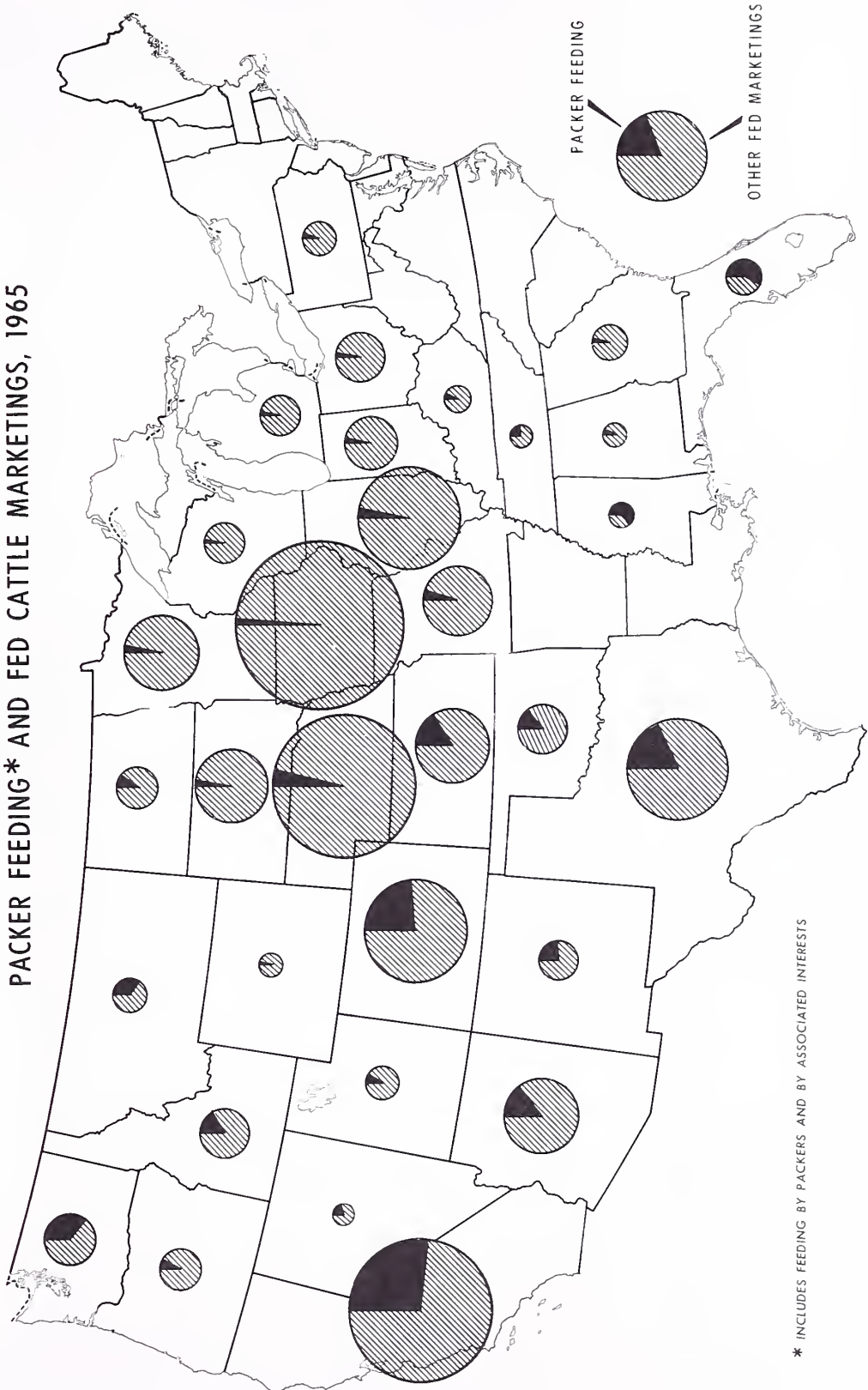
* INCLUDES FEEDING BY PACKERS AND BY ASSOCIATED INTERESTS

Figure 1

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TABLE 2.--Marketings of fed cattle, volume of packer feeding, and packer feeding as percent of fed marketings, 32 states, 1965

Region and state	Fed marketings	Volume of packer feeding			Packer feeding as percent of fed marketings		
		Packers	Associated interests[1]	Total[2]	Packers	Associated interests[1]	Total[2]
N. Central	1,000 hd.	------	1,000 hd.	-----	------	Percent	-----
Ohio	289	6.1	1.6	7.7	2.1	.6	2.7
Indiana	342	6.3	4.9	11.2	1.8	1.4	3.3
Illinois	1,160	11.4	16.2	27.6	1.0	1.4	2.4
Michigan	202	1.1	2.3	3.4	.5	1.1	1.7
Wisconsin	194	0.2	0.1	0.3	.1	.1	.2
Minnesota	649	11.8	6.8	18.6	1.8	1.1	2.9
Iowa	3,013	19.8	14.2	34.0	.7	.5	1.1
Missouri	476	17.6	3.4	21.0	3.7	.7	4.4
North Dakota	188	16.8	--	16.8	8.9	--	8.9
South Dakota	556	16.0	1.8	17.8	2.9	.3	3.2
Nebraska	2,438	72.3	10.0	82.3	3.0	.4	3.4
Kansas	635	85.1	11.7	96.8	13.4	1.8	15.2
Total	10,142	264.5	73.0	337.5	2.6	.7	3.3
West							
Montana	141	12.9	35.3	48.2	9.1	25.0	34.2
Wyoming	62	1.4	0.2	1.6	2.3	.3	2.6
Idaho	272	39.0	6.3	45.3	14.3	2.3	16.6
Colorado	1,144	67.5	201.0	268.5	5.9	17.6	23.5
New Mexico	173	28.3	11.6	39.9	16.4	6.7	23.1
Arizona	650	81.9	12.6	94.5	12.6	1.9	14.5
Utah	125	8.1	1.3	9.4	6.5	1.0	7.5
Nevada	50	6.8	3.5	10.3	13.6	7.0	20.6
Washington	306	106.2	4.3	110.5	34.7	1.4	36.1
Oregon	167	7.9	4.5	12.4	4.7	2.7	7.4
California	2,282	310.3	278.0	588.3	13.6	12.2	25.8
Total	5,372	670.3	558.6	1,228.9	12.5	10.4	22.9
South							
Georgia	139	9.1	2.4	11.5	6.5	1.7	8.3
Florida	146	38.9	45.7	84.6	26.6	31.3	57.9
Kentucky	90	6.3	1.0	7.3	7.0	1.1	8.1
Tennessee	51	11.3	1.1	12.4	22.2	2.2	24.3
Alabama	71	2.5	--	2.5	3.5	--	3.5
Mississippi	64	11.4	30.2	41.6	17.8	47.2	65.0
Oklahoma	300	29.4	11.0	40.4	9.8	3.7	13.5
Texas	1,094	175.1	25.6	200.7	16.0	2.3	18.3
Total	1,955	284.0	117.0	401.0	14.5	6.0	20.5
N. East							
Pennsylvania	116	0.4	3.8	4.2	.3	3.3	3.6
Other States	265	61.9	15.4	77.3	23.4	5.8	29.2
U.S. Totals	[3]17,850	1,281.1	767.8	2,048.9	7.2	4.3	11.5

[1] Feeding by packer-associated interests covers separate feeding by owners, directors, officers, employees, non-reporting subsidiaries and affiliates of packers. [2] Totals do not add in some cases due to rounding. [3] Total is for 39 states accounting for most fed marketings in the United States.

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Packer Feeding at the Plant Level

A survey of six packing firms in 1962 shows that packer feeding at individual plants ranged from no feeding at all to the feeding of more than 50 percent of total cattle slaughter.

The six firms operated 75 plants (Table 3). Packer-fed cattle were slaughtered at 48 of the 75 plants. At about half of the 48 plants, packer-fed cattle accounted for less than 5.0 percent of slaughter (excluding calves). A few plants were quite substantially integrated with feeding operations. There were individual plants at which packer-fed cattle amounted to 27 percent, 38 percent, and 58 percent of annual slaughter.

Table 3. Number of cattle slaughter plants by percentage of packer feeding, six firms, 1962[1]

Packer feeding as percent of cattle slaughter	Number of plants
none	27
under 1.0	6
1.0 - 4.9	19
5.0 - 9.9	8
10.0 - 14.9	5
15.0 - 19.9	5
20 or more	5
Total	75

Source: Special reports of six meat packers filed with the Packers and Stockyards Division.

[1] The sample included four national packers and two slaughtering food chains, and did not cover feeding by packer-associated interests. Packer feeding amounted to 250,000 head for the 48 plants (one-fourth of packer feeding in the United States) and was 6.0 percent of cattle slaughter, excluding calf slaughter, at those plants.

III. PACKER FEEDING AND MARKET STRUCTURE

The growth of packer feeding has two distinct kinds of significance in the livestock industry.

The first relates to the make-up of American agriculture. To the extent feeding is done by packers in their own feedlots, it is no longer an agricultural enterprise. Farmers who had previously fed cattle would no longer have that source of employment and income. The impact of substantial relocation of feeding would be great, as the finishing of hogs, lambs and cattle is a major enterprise and a sizeable source of farm income. Obviously, this impact would be sharpest in the feeding areas of the Midwest and Far West.

The second major significance of packer feeding relates to its effect on the existing structure of marketing, including price-making.

Does packer feeding affect the market price of fed cattle at any given time?

The comments that follow in this chapter will relate to the principles of price-making. They are drawn from a more complete and more theoretical explanation of market pricing in connection with packer feeding, presented in the Appendix of this report. Chapter IV examines actual data for a selected market.

If packer feeding of cattle increases the total volume of feeding, it will definitely depress the overall level of fed cattle prices. However, it is doubtful that packer feeding increases total feeding to any appreciable extent. More likely it is a replacement of feeding for market sale, rather than a net addition. Conversely, the elimination of packer feeding would not likely result in any appreciable lessening of total cattle feeding. More likely, approximately the same number of cattle would be fed by others.

If this be true, the effect of packer feeding on prices for fed cattle will depend on (1) packers' policies as to when they slaughter their own cattle; and (2) the competitive structure in cattle pricing. If packers only draw on their cattle when the current market supply is short, and if packers who feed enjoy no competitive advantage--that is, if they are perfectly or purely competitive--packer feeding serves to stabilize slaughter volume and cattle prices and has no further effect.

If, on the other hand, a packer enjoys some degree of power in the market--called "oligopsonistic" power--it is in a position to employ its own cattle to its own advantage. It has the capacity to use its own cattle to depress prices to some degree.

Packer Feeding in a Highly Competitive Local Market

In any local market[1] where there are a number of packers or packer-buyers, none so large as to dominate the market or to be capable of exerting independent influence on the market, the effect of any packer feeding of cattle may be described as follows:

(1) The individual small packer can do nothing to influence significantly the local market price. The market price will be unaffected as a small packer substitutes his own fed cattle for market purchases in varying amounts or as he leaves the market entirely.

(2) The small feeding packer, in direct competition with independent feeders, will substitute his own supplies for market purchases when the market price is above an equilibrium or normal level and will save his own cattle as the market is oversupplied and the price is down. Such behavior by the individual small feeding packer will have no substantial effect on the market price but may facilitate slaughter scheduling by the packer and contribute to more efficient plant operation.

(3) A significant volume of packer feeding by a large number of small packers at a market could reduce market demand for cattle and temporarily lower prices at the market if they should all follow similar practices as to when they buy and sell. If they should all empty their feedlots when prices are high (and market supplies are scarce), they would contribute some stability to the market for fed cattle.

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[1] The term "market" includes public markets, such as terminals and auctions, as well as direct markets.

The chances that small packers will in fact follow similar patterns are probably not very high. The conclusion holds that small packers acting independently would have little if any, net effect on prices of fed cattle. They could have some stabilizing influence, depending on their management practices.

Packer Feeding in an Imperfectly Competitive Local Market

Although there are various possible forms of "imperfect competition," the most common form in local cattle markets is dominance by relatively few buying firms. In a locality that may be regarded as a separate market area, often two, three, or four buyers of fed cattle each buy a substantial fraction of the area's total marketings. Each buyer is said to have a substantial "market share," and the form of imperfect competition is known as "oligopsony."[2]

In oligopsony, a large firm is important enough in the market that its actions have an appreciable effect on the market. The effect is usually short-term, and it is usually of limited scale, but an oligopsonistic buyer can affect prices.

This does not mean that the oligopsonistic firm always benefits from its position. During periods of comparative scarcity of supplies, a large individual buyer in a local market must pay increasingly higher prices if it presses for sustained or increased market purchases. On the other hand, such a buyer will be capable of depressing the local price if it restricts its purchase volume. Generally, such a packer can use its internal flexibilities in management to take advantage of a local supply situation. Often, though not always, the firm will use its power to escape some of the effects of a local shortage of supply, or to exploit a local surplus.

An oligopsonistic buyer of livestock can use its strength in the local market to influence price because suppliers are seldom able to react instantly, by diverting or reshipping their animals to other markets. They do not have advance information that would lead them to take those steps, and it is costly for them to ship a longer distance to another market. There is usually enough inelasticity in the local supply that an oligopsonistic buyer can influence the local price for a time. Degrees of market isolation do exist and prices at an individual market can deviate measurably from prices at other markets in spite of corrective market forces at the wholesale and live-animal levels.

An essentially nation-wide wholesale market for the output of packers tends to keep local market prices in line with prices at other markets as packers compete for slaughter animals and wholesale outlets. Diversion of livestock flows is much less effective than diversion of carcass flows in correcting short-run price deviations. Compensating adjustments in product flows occur more readily at the wholesale level because carcass prices are communicated more freely and meaningfully between buyers and sellers over a wider geographic area than are livestock prices. Also, the direct and indirect costs of moving live animals limit corrective flows of live animals.

Corrective flows of wholesale beef or live animals are not immediate. Nor are they always complete. Some degree of market isolation and price distortion may still remain. Local prices can be out of alignment with prices at other markets for an extended period.

A recent study of hog pricing at a major terminal market demonstrated that a local market can be depressed below other markets for considerable periods of time.[3] This study shows that the market price for 200-220 pound mixed U.S. Grade 1, 2, and 3 hogs at the Louisville market declined by about $.25 per cwt. compared to other markets as one of two large buyers left the market. This conclusion was reached by comparing prices 69 weeks before the structural change with prices 87 weeks after. The fact that the prices were significantly depressed for an extended period under a less competitive structure is indicative of pervasive oligopsony power. There was a degree of market isolation and resource immobility that could be, and apparently was, exploited over a considerable period.

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[2] The term "oligopsony" is counterpart to the more familiar term "oligopoly." Oligopoly refers to a relatively few sellers of a product in a market. Oligopsony refers to a situation of relatively few buyers. A situation of one seller would be referred to as monopoly, and a situation of one buyer would be referred to as monopsony.

[3] Love, Harold G., and Milton Shuffett, "Short-Run Price Effects of a Structural Change in a Terminal Market for Hogs." J. Farm Econ., August 1965, pp. 803-812.

It is the oligopsonistic packer that is able to utilize its packer feeding operations to influence the price of fed cattle in a local market. Only the oligopsonistic packer can do that, and the possible effects of packer feeding on the price of cattle are confined largely to markets where oligopsony exists. This, of course, ignores the monopsony case of a single buyer which is extremely rare.

As is shown in the Appendix, where a degree of oligopsony exists, a packer's own supply of fed cattle can be used to restrict market purchases and exploit the market by paying lower prices than otherwise would have been paid. The amount of the price effect will depend on the extent of the packer's oligopsony influence as well as on how readily suppliers (local feeders) can divert their marketings to other markets.

An oligopsonistic packer that has a supply of cattle in its feedlots can use those cattle as a bargaining tool. Its fed cattle serve as a standby reserve in its price negotiations. Livestock sellers know that such a packer can fulfill his slaughtering needs at a particular time by transferring his own cattle to his plant, instead of buying cattle on the market. And since such a packer is--by definition--large enough to exert an influence on the local market, its management of its fed cattle during price negotiations has an effect on the local market price. Stated simply, in the short run, packer feeding can confer an extra degree of market power on an oligopsonistic packer.

All of the above explanation relates only to the ability of a packer to employ its reserve of cattle on feed as a bargaining tool when it buys cattle in a local market. It does not indicate whether, and how commonly, packer feeding has such effects. Doubtless, in some cases it would and in others it would not.

Packer Feeding and Marketing Efficiency

Efficiencies in slaughter scheduling are possible from packer feeding in both a highly competitive market and under oligopsony. Market supplies, especially in the Midwest, tend to vary from day to day, from week to week, and by seasons of the year. Consumer demand tends to be quite stable from week to week during the year. The result is price variability at the live-animal, wholesale, and retail levels.

In the short run, daily and weekly slaughter scheduling may be facilitated by supplies available from the packer's feedlot. Also, if placements are made properly, packer feeding may level out seasonal variations in market supply. No doubt, packer feeding does contribute to more efficient slaughter-plant operation in some cases, and, at the same time, helps packers to better serve their outlets.

Nevertheless, there is reason to believe that the efficiency aspects of packer feeding are not of transcending importance in all areas. One reason is that a packer can use direct purchases to stabilize short-run supply. Nearly one-half of slaughter cattle purchases (not including calves) by packers in the United States is obtained by direct dealings with producers and country dealers (about 45 percent in 1964).[4] Typically, direct purchases are made for delivery the following week and can be scheduled for slaughter on any particular day. The packer with access to a direct market normally has some committed supplies which can be called upon to start slaughter early Monday morning, before market supplies can be obtained. Such committed supplies also can be called upon during the week as supplies are scarce at public markets. This confers a degree of flexibility upon the packer, similar to that afforded by packer feeding.

Much of the packer feeding of cattle takes place in the West (over one-half of the national total) where direct trading is most prevalent. Terminal market receipts tend to be more variable in the North Central States. But here, too, direct trading provides a source of needed flexibility.

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[4] Packers and Stockyards Resume, Vol. III, No. 11, November 26, 1965, p. 5. The percentages were 31.7 for calves, 63.1 for hogs, and 57.7 for sheep.

Packer feeding may be useful to packers in some Mountain and Southern States where independent feeding has not developed sufficiently to support regular full capacity plant operation. While packer feeding may alleviate such problems to some degree, increased packer feeding is not likely to stimulate independent feeding in affected areas.

In Chapter IV, actual data for a particular market are reported. At some times during the year studied, packer-fed cattle were moved to slaughter in a pattern that appeared to stabilize supplies. But at other times they were moved in a different pattern, one that had the effect of depressing the local price.

IV. ANALYSIS OF A SELECTED MARKET

The Market

The market selected for detailed analysis has ranked among the top ten terminal markets in saleable cattle receipts and sales of slaughter steers and heifers during recent years. It serves as the primary source of supply for nearby cattle slaughtering operations. During recent years, nearby packers have purchased about 96 percent of their cattle slaughter requirements at the market. The remaining requirements have been supplied by packer feeding (about 3 percent) and by country purchases (about 1 percent).

The demand side of the market is composed of a few buyers, each accounting for a sizeable share of the market. More than three-fourths of the salable receipts at the market during recent years have been purchased by four packers with slaughter plants nearby. The remainder of the salable receipts is accounted for by sales of non-slaughter cattle such as stockers and feeders, and sales of slaughter cattle to order buyers, dealers, and other packers.

In 1962, the year for which detailed information was analyzed, one of the four large packers buying at the market engaged in cattle feeding. Other packers buying at the market fed few cattle in 1962. The predominant firm in packer feeding slaughtered 18,187 head of packer-fed cattle at its plant, or about 10 percent of its slaughter.

Procedures

The market analysis covers the year 1962 and centers on the cattle feeding activity of the individual packer which shipped 18,187 head of packer-fed cattle to its plant near the market. The analysis is based on weekly data for packer-fed cattle shipped to plant by that packer only. Data were not available on the timing of shipments for the few cattle fed by other packers at the market in 1962.

The market analysis is composed essentially of two parts. The first part concerns the manner in which packer-fed cattle were used in relation to weekly variations in market supplies of fed cattle. The purpose of the first part is to determine whether packer feeding was used regularly to counter short supplies at the market. The weekly volume of Choice steers and heifers sold out of first hands at the market is compared with the weekly volume of packer-fed cattle shipped to slaughter.[1]

The second part of the market analysis is concerned with any relationship which may have existed between the number of packer-fed cattle shipped to plant by the sample packer and the local price for fed slaughter cattle relative to prices at other markets. More specifically, did packer-fed shipments have a price-depressive effect, a market-stabilizing effect, a combination of these, or no effect at all?

If packer-fed cattle were used with a price-depressive effect, large or increased numbers of packer-fed cattle moved to plant would be associated with a low price in the local market compared to other markets. On the other hand, if packer feeding were used with a market-stabilizing effect, large or increased shipments of packer-fed cattle to plant would be made when the local price is high or increasing compared to other markets. A combination of these results is possible or even likely under actual market conditions. The absence of perceptible impacts is also possible in the case of insignificant packer feeding relative to the size of the local market.

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[1] The weights of packer-fed cattle were primarily within the Choice grade range. Because feeding packers aim for the Choice grade in feeding, volumes (and prices) for Choice slaughter cattle are used in the analysis.

Relationships between the number of packer-fed cattle moved to plant and the local price for Choice steers (compared to the average of the same price indicator for seven other major terminals) are studied with the aid of graphs and regression analysis.[2] Weekly average sales prices for Choice steers are used throughout (average cost per cwt. for sales out of first hands).

Regression analysis is used to provide measures of the separate impacts of packer-fed cattle and regular market supplies upon the local price. Comparison of the impacts of a given increase in the number of packer-fed cattle (such as 100 head) and the same increase in market supplies provides a means of determining the relative importance of packer feeding to pricing in the market.

Packer Feeding and Market Supplies

The sample packer's cattle were not used regularly with the effect of countering short supplies at the market. There was no consistent relationship throughout the year between the market supply of cattle (Choice steers and heifers combined) and shipments of packer-fed cattle to slaughter (Figure 2). The weekly volume of packer-fed cattle shipped to plant by the sample packer averaged about 350 head per week for the year 1962, and varied from zero to about 1,100 head. The observed variations in numbers of packer-fed cattle shipped to plant would appear to be large enough that they could have been used as a factor in stabilizing the market. In this case, however, the packer did not effectively pursue a policy of levelling the market supply with his own feedlot cattle.

There are weeks, and periods of several weeks, when packer-fed shipments contributed to, and exaggerated, the fluctuations in the market. The opening weeks of the year are the clearest case. There are other times when packer-fed cattle partly offset swings in market receipts, as in the 29th, 44th, and 45th weeks. During other periods, there is no observable relationship between packer-fed shipments and market receipts. The major inference to be drawn is negative: packer-fed cattle were not consistently moved to slaughter to level out the local market supply.

Packer Feeding and Market Prices

Packer-fed cattle transferred to the plant of the sample packer had a persistent depressive effect on the local price for Choice steers compared with prices at other markets. During the first five or six months of the year, the local price was consistently below the average for other markets, about in proportion to the number of packer-fed shipments to plant (Figure 3). As packer-fed shipments to plant declined from a level of about 1,100 head a week early in the year to about 100 head in the 15th week, the local price approached the level of prices at other markets. From mid-year until the 38th-42nd weeks, packer-fed shipments generally declined to a low level (zero in the 40th week) and prices at the local market improved to the point that they exceeded the seven-market average by about $.50 per cwt. in the 40th week. Then, as packer-fed shipments to plant increased during the last 10 or 12 weeks of the year, the price situation at the market deteriorated in comparison to other markets.

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[2] Regression analysis is a statistical procedure which may be used to measure relationships between factors (variables) on the average. In general, regression analysis reduces relationships between factors to algebraic equation form. Relationships are estimated based on the observed data (in this case weekly prices and quantities for the 52 weeks of 1962). Also, this procedure provides essential information on the degree of confidence which may be placed on estimated relationships, i.e. the probability that observed relationships are due merely to chance.

13

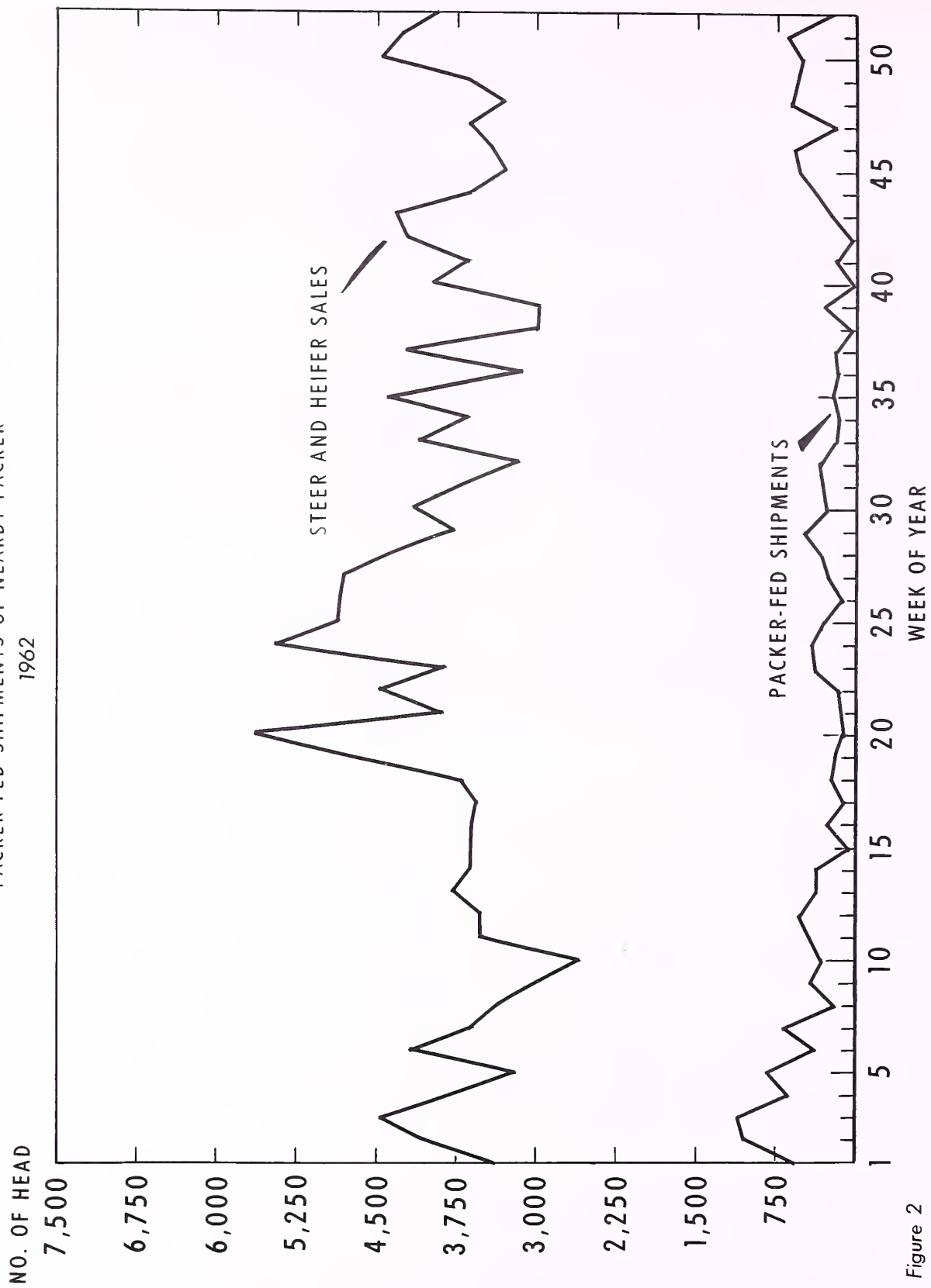CHOICE STEER AND HEIFER SALES AT LOCAL TERMINAL MARKET, PACKER-FED SHIPMENTS OF NEARBY PACKER 1962
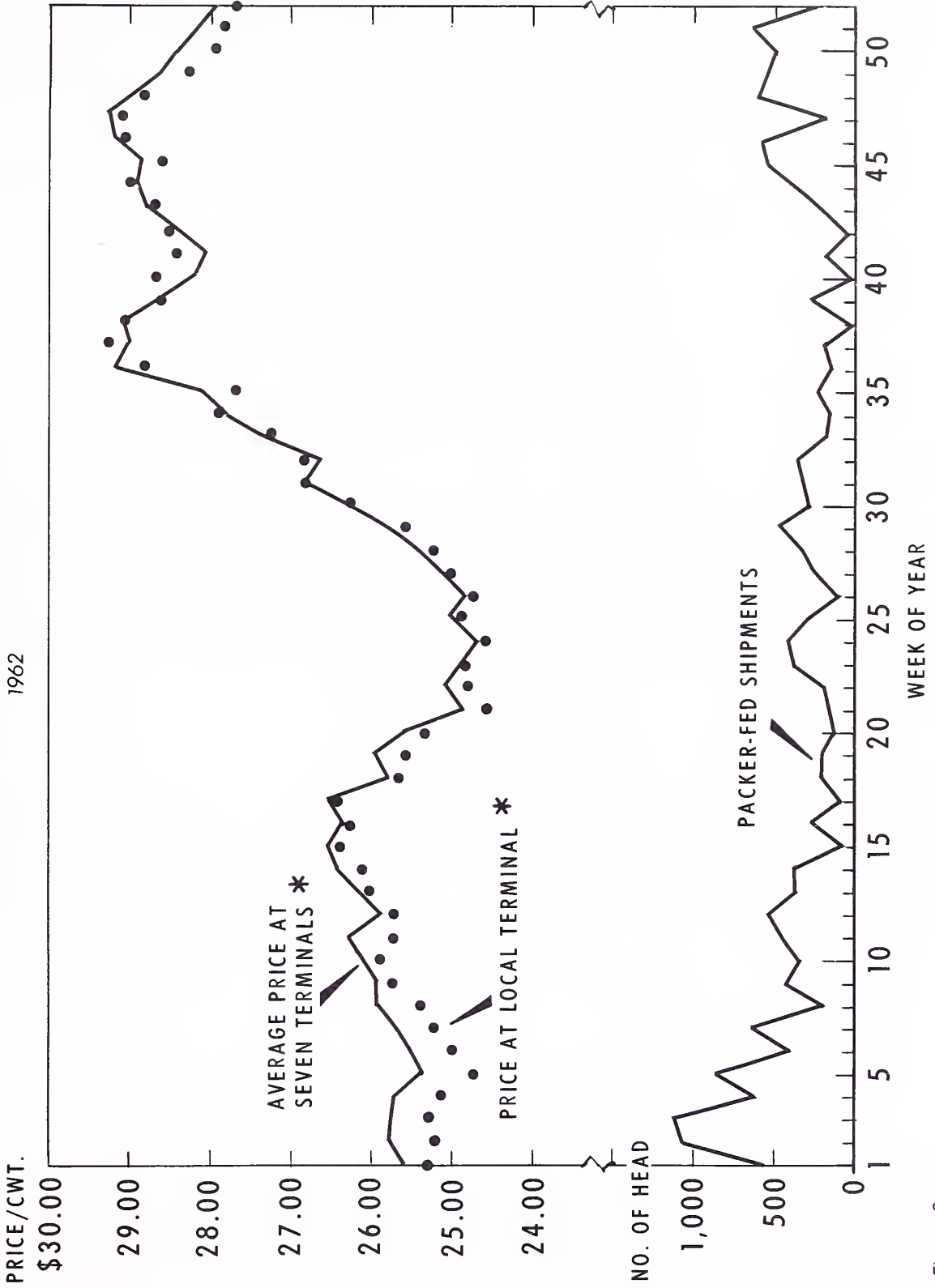
NO. OF HEAD

STEER AND HEIFER SALES

PACKER-FED SHIPMENTS

WEEK OF YEAR

Figure 2

14

LOCAL PRICE AND SEVEN MARKET AVERAGE PRICE FOR CHOICE STEERS, PACKER-FED SHIPMENTS OF NEARBY PACKER 1962

Figure 3

15

These relationships may be observed more clearly in Figure 4, where packer-fed shipments to plant are charted on a weekly basis against the difference between the local price and the average of prices at the seven other markets. It is quite apparent that packer-fed shipments by the sample packer did distort the relationship between the local terminal price and prices elsewhere. Large-scale packer feeding in this case, by a powerful local packer, did have a depressive effect on prices at that market compared to prices at other markets. Figure 4 also demonstrates the degree of market isolation which can exist.

Price differences ranging from $.68 per cwt. below the general level (in the 5th week) to $.48 per cwt. above the general level (in the 40th week) provide a measure of the degree of market isolation. They are a measure of the extent to which weekly average prices can be affected by changes in shipments of packer-fed cattle--shipments of the importance of those which took place in this market and by a packer with some degree of oligopsony power.

Regression analysis of the data shown above in graphs confirmed the conclusion that packer-fed shipments to plant depressed the local price relative to prices at other markets. A 100-head increase in packer-fed shipments to plant, on the average, lowered the local average price for Choice steers relative to other markets for the entire week by about $.06 per cwt.[3] Or, a 100-head decrease in packer-fed shipments to plant allowed the local price to improve by about $.06 per cwt. compared to the other markets. Since packer-fed shipments varied from zero to over 1,000 head per week, packer feeding affected the local weekly price by as much as $.50 per cwt.

On the other hand, the regression analysis indicated that the weekly supply of Choice steers (or Choice steers and heifers combined) at the market had much less effect on price. A 100-head increase in weekly Choice steer market receipts lowered the local price relative to other markets by only $.005 per cwt. (compared with $.058 per cwt. for packer-fed cattle). In other words, the price impact from a 100-head increase in packer-fed cattle transferred to plant was about 12 times as great as the impact of a 100-head increase in the supply of Choice steers sold out of first hands at the market. Packer-fed supplies transferred to plant had an inordinate impact upon the local weekly average price.

Conclusions and Implications

The possibilities for price manipulation with packer feeding depend primarily upon market structure and reactive ability of supply. A degree of oligopsony must be present for individual packers to depress prices with their own fed supplies. In order for large buyers to depress prices and exploit a market, they must have significant market shares and significant packer-fed supplies. In addition, there must be a degree of market isolation and rigidity in supply such that the market is incapable of adjusting supply as rapidly as packers

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[3] Least squares regression analysis was used on the variables (raw form) discussed above, covering 52 weeks of the year 1962. The equation was:

$$Y = 0.1686 - .0581(X_1) - .0047(X_2)$$
$$(.0119) \qquad (.0044)$$
$$R^2 = .3352$$

Y = local weekly average cost of Choice steers at the sample market minus the 7-market average price for Choice steers, i.e., the price difference shown in Figure 4;

X_1 = weekly volume of packer-fed cattle transferred to plant (in hundreds of head);

X_2 = weekly volume of Choice steers sold at the market (in hundreds of head).

The coefficient for X_1 (packer-fed supplies) is highly significant, whereas the one for X_2 (market supplies) is of very questionable significance. The volume of Choice steers and heifers combined was included as a variable in another equation along with X_1 but it did not enter at an "F" of 1.0.

In similar analyses of this market, packer-fed shipments distorted the relationship between the local weekly live price for Choice steers and the wholesale price for Choice steer beef carcasses, thus affecting the gross margin of packers in the market.

DIFFERENCE BETWEEN LOCAL PRICE AND SEVEN MARKET AVERAGE PRICE FOR CHOICE STEERS,
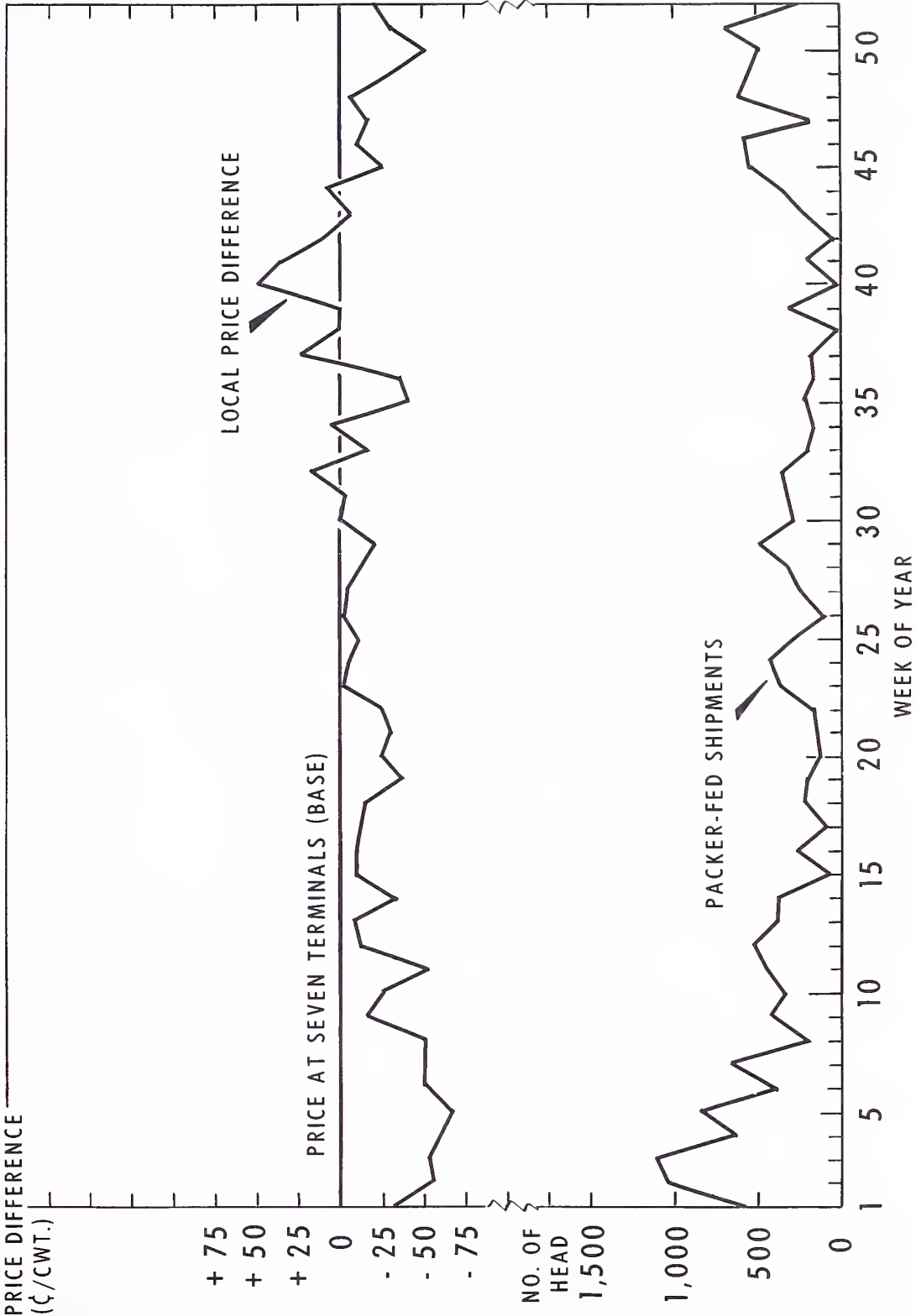PACKER-FED SHIPMENTS OF NEARBY PACKER
1962

Figure 4

17

can affect demand. It is quite unlikely that a terminal market or any market area can adjust perfectly to suddenly reduced demand of a large feeding packer unless it is forewarned of the volume of packer-fed supplies that are to be transferred to slaughter--and even then some independent feeders would find it hard to make quick adjustments.

The findings of the empirical analysis reported above bear this out. The fed shipments to plant by the packer studied (an oligopsonist with large-scale feeding) depressed prices at the local terminal approximately in proportion to the volume of its own fed supplies slaughtered. Independent feeders were incapable of adjusting quickly enough to the packer's actions to prevent the price weakness.

Oligopsony positions appear to be quite prevalent across the country in livestock procurement. Most terminal public markets have 10 or fewer buyers accounting for three-fourths of market sales. All terminal livestock markets are oligopsonistic on the basis of eight firms controlling 50 percent or more of slaughter cattle purchases.[4] Some are dominated by only one or two packers. In addition, there are many areas away from large public markets in which there is only one or a few outlets for slaughter livestock.

Thus, the findings of this study for a single market appear to be applicable--or potentially applicable--to most other markets and market areas.

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[4] This is a criterion of a Type I oligopoly in measuring concentration of market structure. See: Carl Kaysen and Donald F. Turner, Antitrust Policy: An Economic and Legal Analysis (1959), p. 30.

V. SUMMARY

Packer feeding of cattle has increased quite markedly since the mid-1950's. The number of packing firms engaged in cattle feeding has increased moderately and the number of animals fed by packers has more than doubled. About one-sixth of all commercial cattle slaughterers and about one-fourth of the cattle slaughterers using Federal inspection are engaged in cattle feeding.

More than one of every ten cattle fed in the United States is fed by a packing firm or an interest associated with a meat packer. In 1965, more than 2.0 million head of cattle were fed by meat packers or packer-associated interests. This amounted to 11.5 percent of the fed cattle marketed in the 39 leading states in cattle feeding (17.8 million head). About one-third of the packer feeding was by packer-associated interests, the remainder by packers themselves. The States of Colorado, California, and Florida account for the bulk of cattle feeding by interests associated with packers.

The West is the leading region in packer feeding of cattle. Although this region is the source of only about 30 percent of all fed cattle marketed in the United States, it accounts for 60 percent of the packer feeding. Most all the remaining packer feeding is done in the North Central region, the primary cattle feeding region, and in eight States of the South.

Packer feeding, including that by packer-associated interests, amounts to one-fifth of fed cattle marketings in the West and South (22.9 and 20.5 percent, respectively, in 1965). The proportion is much smaller in the North Central region. The figure was only 3.3 percent in 1965, although packer feeding was one-third of a million head in the region.

The leading States in packer feeding of cattle are: California, Colorado, Texas, Washington, Kansas, Arizona, Florida, and Nebraska (in order of declining packer feeding in 1965). In these States, the proportion of total fed cattle marketings accounted for by packer feeding ranged from 3.4 percent in Nebraska to 57.9 percent in Florida.

Packer feeding varies greatly at the plant level. In 1962, out of a sample of 75 plants operated by six major packers, 48 slaughtered packer-fed cattle. At 25 of the 48 plants, packer-fed cattle accounted for less than five percent of slaughter. However, 15 plants slaughtered 10 percent or more packer-fed cattle. In three of them, packer-fed animals were 27 percent, 38 percent, and 58 percent of plant slaughter.

Packer feeding by one slaughterer at a leading terminal market in 1962 was analyzed statistically. Packer feeding was about three percent of cattle slaughter by packers located near the market. The primary packer-feeder in the area fed about 10 percent of its cattle slaughter. Data on movement of cattle by weeks throughout the year did not show evidence that shipments of packer-fed cattle consistently offset fluctuations in the receipts of cattle on the local (terminal) market. Apparently, packer-fed shipments did not serve to stabilize the market supply to any great extent.

The statistical analysis indicated that packer feeding had significant depressive effects on weekly average prices at the terminal market, relative to prices at other terminals. Price effects were within the range of $.25 to $.50 per cwt. on the weekly average price for Choice steers at the market. According to the mathematical analysis, a given increase in packer-fed supplies transferred to plant had more than 10 times as much effect upon the local price for Choice steers as did the same increase in market supplies of Choice steers.

The results of the market analysis are consistent with the principles of demand and supply for pricing in local markets. The overall level of prices normally would not be significantly depressed by packer feeding in a highly competitive market. However, in a market with a very few large buyers accounting for most of the market supply, the actions of one or more of the large oligopsonistic buyers can have an independent effect on the local market price.

Appendix

THEORETICAL ANALYSIS OF SLAUGHTER CATTLE
PRICING IN MARKETS WITH PACKER FEEDING

The purpose of this appendix is to sketch in more detail than in Chapter III the basic principles of the economic theory of demand and supply as they relate to packer feeding and its possible effect on slaughter cattle pricing. The theoretical analysis summarized below underlies the analyses in Chapters III and IV. In both the empirical and theoretical market analyses, the emphasis is upon pricing in the local market.

Traditional Mashallian short-run partial equilibrium models are used throughout the theoretical analysis of pricing in hypothetical local market situations.

In the theoretical analysis below, packer feeding is considered in markets with three structures on the demand side. These are: (1) perfect or pure competition--a market having enough buyers so that no individual buyer can affect the market price; (2) oligopsony--a market in which a relatively few buyers are individually large enough to have significant effects upon the market price; and (3) monopsony--a market with only one buyer in which case that buyer in effect sets the price, given supply conditions at the market.

The extremes of perfect or pure competition and monopsony (items (1) and (3) above) are seldom found under actual market conditions. Rather, most markets are a combination of both highly competitive and monopsonistic elements. Thus, the most common structure is oligopsony. The typical market for slaughter cattle has a few large buyers (10 or less usually) which account for a substantial share of the market (such as 50 to 75 percent). The remainder of the local supply ordinarily is taken by a larger number of small packers which comprise a so-called "competitive fringe" in the market.

Although oligopsonistic demand structures are most common, it will be useful to consider pricing under perfect competition and monopsony before considering the oligopsony case. Basically, the principles of pricing under oligopsony are a combination of those for the polar cases of perfect competition and monopsony. The results of oligopsony, in terms of both market price and volume, generally lie between the perfectly competitive and monopsony solutions.

Pricing in a Highly Competitive Structure

The essential characteristics of a highly competitive market (be it a terminal, auction, or direct market) for a specified product are: (1) a large enough number of buyers in the market so that the offers to buy or actual purchases by individual firms cannot significantly affect price at the market; (2) a large enough number of sellers in the market so that the volumes offered for sale or sold by individual sellers cannot significantly affect the market price; (3) both buyers and sellers are well informed and in close communication with each other; and (4) there is optimum mobility of the commodity, so that the local supply can be shifted readily to other markets.

In a market under these conditions, competitive interaction among buyers and sellers will result in prices that are in line with prices at other markets. As individual buyers and sellers seek their best profit alternatives, based on essentially perfect knowledge of local demand and supply conditions as well as prices elsewhere, the local price will be aligned with prices at nearby alternative markets and prices in the industry across the country.

Demand and supply relationships for a hypothetical perfectly competitive market for Choice steers are shown in Figure A, along with those of a representative packer in the market. The market is in equilibrium at a price of $25.50 per cwt, as 5,000 head of Choice steers are marketed on a weekly basis. This equilibrium or normal price will result in the perfectly competitive market from optimum planning by market participants.

MARKET PRICING OF CHOICE SLAUGHTER STEERS IN A HIGHLY COMPETITIVE MARKET STRUCTURE, WITH MARKET POSITION SHOWN FOR A REPRESENTATIVE PACKER, WEEKLY TRADING
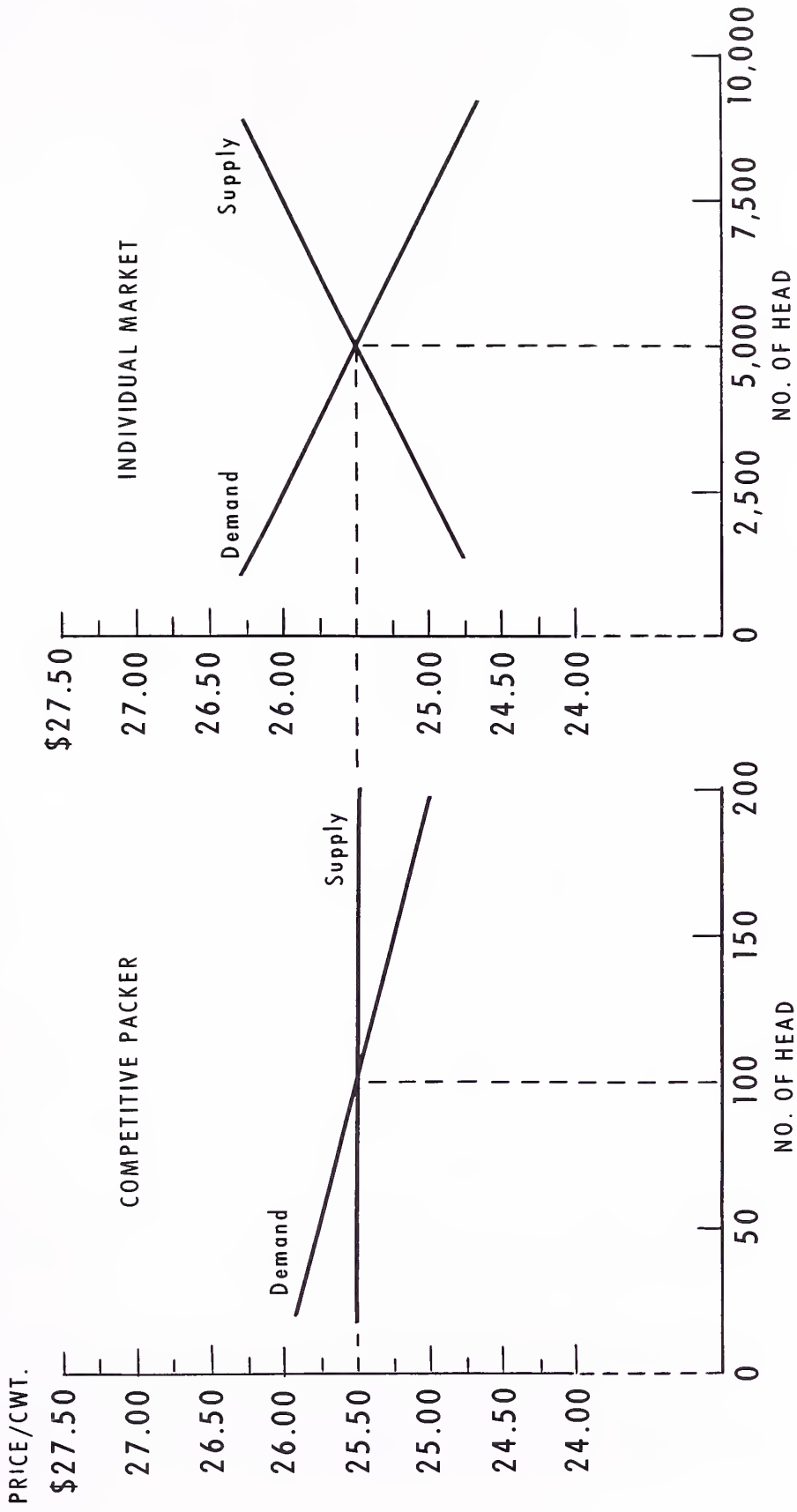

Figure A

In the perfectly competitive market, each packer that buys on the local market cannot influence the market price, up or down, by its own operating decisions. This is true by virtue of the definition of the competitive market.

The fact that an individual buyer cannot significantly affect the market price by virtue of the volume he buys, when translated to theory, means that he faces a horizontal (or perfectly elastic) supply curve. The perfectly competitive packer faces a horizontal supply curve at each price level in the market over the relevant range of purchases for the firm.[1]

In Figure A, we have an individual competitive packer with a horizontal supply curve at the market equilibrium price of $25.50 per cwt. An entire family of such supply curves exists in theory (one for each market price), although only the one for the equilibrium price is shown. Given the market price of $25.50 per cwt., the packer could move along his horizontal supply curve and conceivably buy 50 head, 100 head, or 150 head without significantly affecting the market price.

How many head of Choice steers will the packer buy at any particular price? The answer depends upon the location of the demand curve of that packer for Choice steers. The demand curve of the packer shows the value to the packer of additional animals purchased. It shows the number of head of Choice steers the packer will buy at various market prices.[2]

The packer will purchase additional Choice steers only up to the volume at which demand (i.e., value of animals to the packer) equals the cost of the additional steers purchased. In the example of Figure A, if the price is $25.50 per cwt. the packer will purchase 100 head and take no more since additional animals will add more to costs than revenue (price would be greater than value). Thus, packer purchases are determined by the intersection of the packers' demand curve and the relevant supply curve as given by the market price. Under equilibrium conditions (a price of $25.50), the packer will take 100 head of Choice steers, which in this hypothetical case is 2.0 percent of the market supply.

Packer Feeding in the Competitive Market

It follows from the above description of a competitive market that feeding done by an individual packer can have no appreciable effect on the price of cattle at that market. If the packer has no impact on price without feeding, it will have no impact should it feed cattle.

For example, the competitive packer in Figure A could substitute his own fed cattle for any or all of his equilibrium purchase volume of 100 head. And yet, by so doing, he will not disturb appreciably the market price.

This does not mean that packer feeding as a practice would be without effect if a number of small competitive packers should feed. If many packers were to feed cattle, the total effect of that feeding would depend on its relative volume, on the slope of demand and supply curves for the market, and on the pattern by which packers released their fed cattle into slaughter channels. But it would still remain true that individual small competitive feeding packers would have no discretionary power over price.

Moreover, if such packers generally should draw on their own fed cattle at times when local market receipts are short and the local price is above an equilibrium level, they would contribute week-to-week stability to the market. This would result in more efficient scheduling of slaughter by individual packers and more stable prices. On the other hand, if packers should generally fail to manage their fed cattle movements in such a manner, they would fail

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[1] The horizontal supply curve at the market price becomes, in effect, the marginal supply cost function (MSC function or curve) for the competitive firm. The concept of the marginal supply cost curve is of critical importance in the monopsony and oligopsony cases to be considered later in this Appendix.

[2] The demand function for the packer, in theory, is often called the marginal revenue product function (MRP function or curve)--which literally means the amount by which sales revenue of the packer will be increased by purchasing one more unit of the resource after deducting costs of other inputs.

to stabilize the market or actually add to instability. Again, these conclusions are appropriate only to a highly competitive structure. Such a structure requires a large number of small buyers, possibly 50 or 100 or more, as well as many sellers. Since there are few, if any, such actual markets, we must consider pricing and packer feeding with imperfect competition among buyers.

Pricing in Markets with Imperfect Competition Among Buyers

The demand side of a market becomes imperfectly competitive whenever individual buyers are capable of affecting the price by their market activities. The primary cause of imperfect competition among buyers at any market is a significantly large market share by the individual firm. As the individual firm accounts for an increasing share of the local supply, his market activities increasingly are likely to affect price in the local market. In the remainder of this theoretical analysis, individual buyers (aside from a competitive fringe under oligopsony) are assumed to be capable of affecting the market price, to some degree and for a time, depending upon the specific demand structure of which they are a part.

Pricing under Monopsony

In Figure B, we have presented the hypothetical case of a single buyer, a monopsonist, at the same market which above had a highly competitive demand structure. The market supply curve is the same as before, though now it is faced by only one buyer. In addition, the market demand curve is positioned the same as before. The demand curve now represents the value of additional animals to the one packer rather than to a large number of small packers. (The demand curve need not have the same position as before, but any difference does not affect the logic of analysis.)

Although the demand and supply curves for weekly trading at the market appear to be the same as before, there is one essential difference from the competitive case. The monopsonist alone faces the market supply curve with the result that the market price will decline if the monopsonist reduces the number of animals purchased per week. Or, he must bid up the market price in order to buy more animals per week. This is in contrast with the perfectly competitive buyer who could purchase any reasonable volume in the market without perceptibly affecting the market price, a price over which he had no control.

Further, it must be assumed that the market is sufficiently distant from other markets to allow the monopsonist to exercise some monopoly influence. The distinctive feature of a market under monopsony is that the buyer affects the market price by his decisions as to the numbers he will buy. In more technical terms, he does not face a perfectly elastic (horizontal) supply curve as does the highly competitive firm. Rather, the supply curve faced by the firm slopes upward. As the monopsonist reduces its market purchases the market price will decline. On the other hand, as the monopsonist presses for more market purchases he must pay an increasingly higher price for the total quantity he purchases. The effect is to bid up the local market price.

The familiar principle of marginal cost enters in. If the monopsonistic packer wishes to increase the number of steers it purchases on a particular week, it will find it necessary to pay a higher price for not only the added number of steers but for all it purchases that week. The total increase in expenditure thus will exceed the extra cost for the additional steers. The marginal cost exceeds the price paid. This can discourage him from buying more steers.

This well-established principle of increasing costs of market purchases by a monopsonist is illustrated in Figure B.

The supply curve in Figure B indicates the quantity of steers that will be sold to the buyer as he offers various prices. For example, if the packer offers a price of $25.00 per cwt., the market will supply him with 2,500 head of Choice steers. Associated with this supply curve

MARKET PRICING OF CHOICE SLAUGHTER STEERS
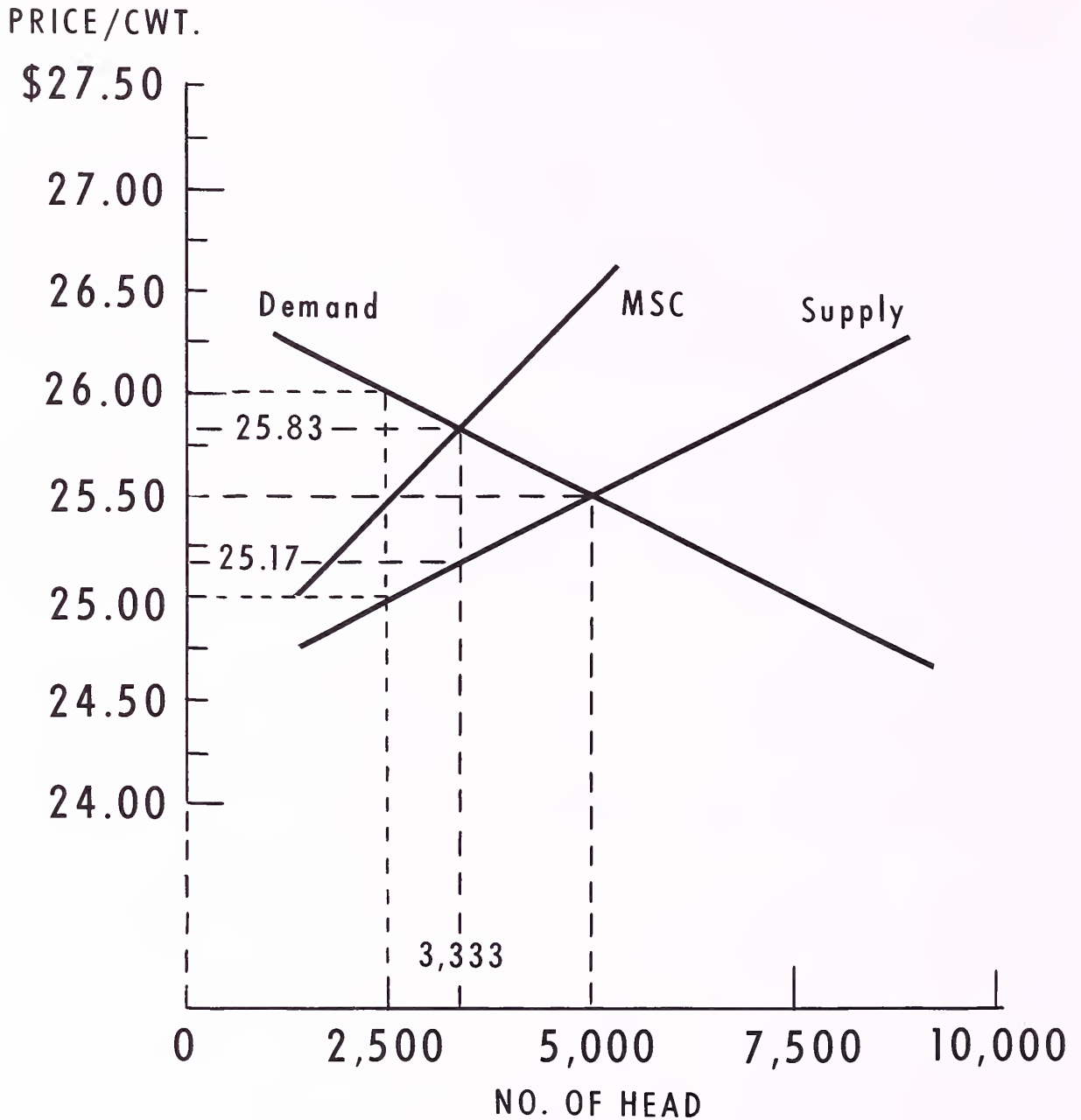## UNDER MONOPSONY, WEEKLY TRADING

Figure B

is a marginal supply cost curve (MSC curve) which indicates the increase in expenditures (per cwt.) as each additional steer is purchased. Although the 2,500 steers can be bought at $25.00 per cwt. (or $250 per 1,000 pound steer), the last steer is in effect costing the packer $25.50 per cwt. (or $255 per 1,000 pound steer). This is the reason the MSC curve lies above the supply curve. Costs per cwt. for the last steer purchased are always greater than the price paid for any particular volume of steers.

The results of monopsony in this case are shown in Figure B. The equilibrium position for the market is at an average weekly price of $25.17 per cwt., as 3,333 head of Choice steers are supplied by feeders and taken by the monopsonist. This equilibrium position is determined by the point of intersection of the demand and MSC curves. At a volume of 3,333 head, the last steer is in effect costing the packer $25.83 per cwt. (MSC). This $25.83 per cwt. is the value of the last steer to the packer (as given by the demand curve). Purchases of more than 3,333 head will add more to costs than to value, as MSC exceeds the return to the packer (demand curve). Purchases of less than 3,333 head are illogical since more purchases up to that number will add more to packer returns than to costs, as demand exceeds MSC.

This monopsony price is in contrast with the competitive equilibrium price of $25.50 per cwt. shown in Figure A. The difference between the competitive price and the monopsony equilibrium price is monopsonistic exploitation of the market.

The effect of purchase volume on pricing under monopsony contrasts distinctly with the competitive case. Whereas the competitive buyer can vary its purchases at will without affecting the market price, increased purchases by the monopsonist raises price at the market and vice versa. The competitive packer decides on the quantity to buy by comparing the value of the animal to him (as given by his demand curve) with a given market price (which is also his MSC). But the monopsonist must compare the value of the animal to him with the higher marginal supply cost (not with the market price) which results from the price impact of his additional purchase volume. Additional steers in effect cost the monopsonist more than they would a small packer at the same market price. The results are fewer purchases and a lower market price with monopsony than with a group of competitive packers having the same slaughter capacity and market potential.

How can a monopsonist exploit a local submarket within an industry by paying lower prices than with competitive buying? A lower monopsony market price is possible not only because the buyer is alone in the market, but also because the local market is partially isolated from other local markets. The monopsonist could not pay a lower price in the local market if the commodity flowed readily between markets. In that case, any decrease in the monopsonist's offering price would choke off some supply; and also, the possibility exists that the market would be invaded by packers from elsewhere seeking to take advantage of the lower prices.

Furthermore, the safety valve of access to other markets is operative only in proportion to the closeness of those markets, and the competitiveness of those markets themselves. Highly effective inter-submarket competition, involving corrective flows of live animals between markets, requires price comparability which is often lacking for fed beef cattle. The inability of sellers to know the precise worth of their animals at alternative markets contributes to market isolation.

Monopsony power may sometimes be temporary since, in time, resources will find other uses. But there are costs involved in resource transfer. Where resources are fixed (cannot be transferred elsewhere or to other uses) and entry barriers exist, monopsony may persist to a degree for a considerable time.

Packer Feeding under Monopsony

In Figure C, we have the same individual market under monopsony, only now the monopsonist is a large-scale feeder as well. How will feeding by the packer affect pricing in the market? How will the solution for monopsony with packer feeding differ from the one for no packer feeding?

MARKET PRICING OF CHOICE STEERS UNDER MONOPSONY
WITH PACKER FEEDING, WEEKLY TRADING

PRICE/CWT.

$27.50

27.00

26.50

26.00

25.83

25.50

25.17

25.00

24.75

24.50

24.00

Demand

MSC

Supply

1,250   3,333

0   2,500   5,000   7,500   10,000
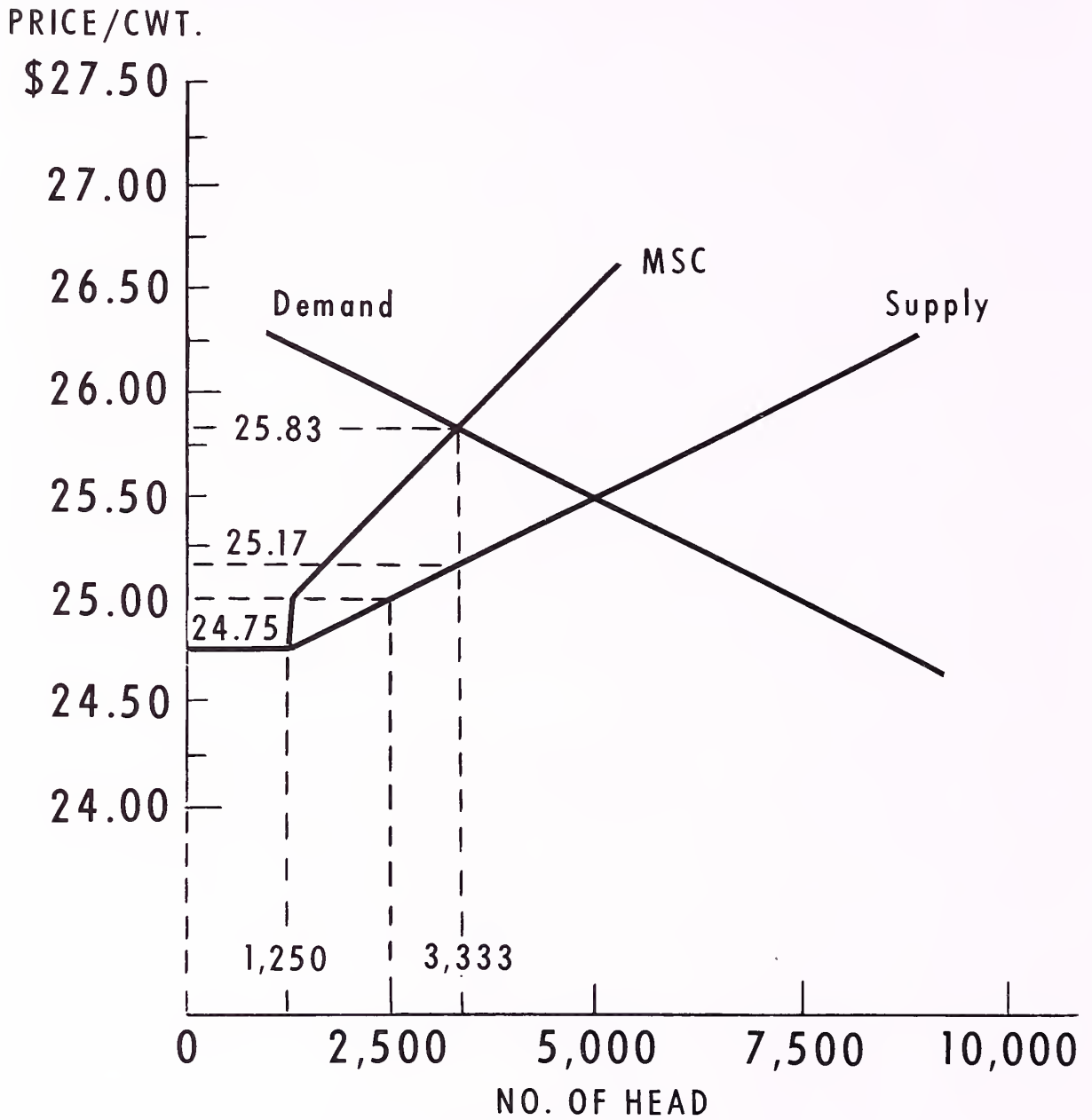
NO. OF HEAD

Figure C

Packer feeding allows the packer to vary the number of cattle it purchases at the market, while still operating at a given slaughter capacity. With packer feeding, the monopsonist may restrict market purchases at any given time using instead packer-fed cattle. Under monopsony, this will lower the market price below what it would have been without packer feeding.

Let us say that the monopsonist is now feeding such that 833 cattle are slaughtered in a given week from its own feedlots.[3] This means that it now needs to purchase only 2,500 head at the market whenever it chooses to draw on its own cattle while slaughtering 3,333 head per week as before. For this volume, it need bid only $25.00, due to the slope and location of the supply curve. This number of head, and no more, will come to market if the price is $25.00 per cwt. (Figure C).

The results of packer feeding are as follows: (1) purchases at the market are reduced to 2,500 head--only half as many as with competitive demand and 833 head fewer than with monopsony without packer feeding; and (2) the market price falls $.50 per cwt. below the competitive level ($25.50 per cwt.) and $.17 per cwt. below the monopsony level without packer feeding ($25.17 per cwt.).

The limit of exploitation in a market by packer feeding is determined by the price level at which there will be entry by other packers or at which supplies of the commodity are no longer forthcoming (as cattle are transferred elsewhere). In Figure C, the market price can be depressed by packer feeding to $24.75 per cwt. for Choice steers, but no further. The reason is that the supply becomes perfectly elastic (i.e., horizontal) at that point. Price offerings of less than $24.75 per cwt. will bring no cattle to market.

In summary, the number of cattle purchased by the feeding monopsonist on the market will be less than purchased by it without feeding. As a result of the restriction in market purchases, the market price will be depressed below the monopsony level without packer feeding. But the price cannot be depressed below a certain level where adequate supplies would no longer be coming to market. The greater the degree of market isolation (and resource immobility), the greater the potential for exploitation by packer feeding in a given monopsony structure in a local market.

Pricing under Oligopsony

As was indicated earlier, oligopsony implies few buyers at a market. Buyers are so few that an individual firm has a market share large enough to affect the market price by the prices it offers or the quantity it buys.

Oligopsony takes many forms. The most severe case of oligopsony is that of only two firms buying the total market supply (called a duopsony). Normally an oligopsony will consist of a relatively few large firms (usually 10 or less) which together account for much of the market (more than 50 or 75 percent of the market). The remainder would be taken by a group of small firms--the competitive fringe. The large firms as a group are often referred to as an "oligopsonistic core."

Regardless of the particular form an oligopsony may take, one principle applies in each case: The volume decision affects price. Higher price offerings by an oligopsonist to get more supplies will tend to increase the market price. Conversely, lower price offerings by an individual oligopsonist will tend to lower the market price. In other words, the oligopsonist faces the same kind of cost structure as the monopsonist, though usually to lesser degree, and exerts a generally similar influence on the market.

In addition, the typical oligopsonist will be aware of and will be affected by price offerings of other oligopsonists in the market. Oligopsonists ordinarily cannot afford to ignore

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[3] The feeding operation of the packer is assumed to be an owned feedlot rather than contract feeding in existing feedlots which previously shipped to the market. Therefore, the supply curve for fed cattle at the market is not affected (shifted to the left) by the packer feeding.

each other's price offerings. This is because the effects of a change in price offered by one oligopsonist will depend upon the reactions of other oligopsonists and any competitive fringe.

Oligopsony normally will result in lower prices than with competitive buying, but not so low as with monopsony. In general, the larger the share of market held by the oligopsonistic core and the fewer firms in it, the more the price will be restricted, and the closer it will approach the monopsony price. Individual firms under oligopsony will face supply curves and associated MSC curves with some slope, but less so than the monopsonist. A lower price offering by a firm normally will affect the market price less under oligopsony than with monopsony. But there will be some price effect, in contrast with the price offer of a highly competitive buyer.

In Figure D, we have demand and supply curves for a market in which an oligopsonistic core of five buyers takes 75 percent of the normal weekly supply of Choice steers. The remainder is taken by a competitive fringe consisting of numerous small packers. The market supply curve is the same as before in the highly competitive and monopsony cases. Feeders supplying the market will sell the same number of steers in response to a particular price offer, regardless of the size of the firm making the offer.

Two market demand curves, not demand curves for individual firms, are shown in Figure D.[4] One is for oligopsony and the other is for the highly competitive buying structure previously presented in Figure A. It is recalled that competitive equilibrium in the market was at a price of $25.50 per cwt. for 5,000 Choice steers sold per week (intersection of the competitive demand curve and the market supply curve).

The oligopsony solution will tend to be at a somewhat lower price and market volume. The increasing cost conditions faced by the oligopsonists (upward sloping MSC functions) result in fewer animals demanded by packers in the market at any particular price. In other words, the market demand curve under oligopsony will be located to the left or below the demand curve for the group of highly competitive packers with the same slaughter capacity. Under oligopsony, the market demand curve is shifted to a position such as is shown in Figure D. Given the oligopsonistic demand curve and the market supply curve, the market equilibrium is at a price of $25.37 for 4,375 head of Choice steers. This is below the $25.50 price per cwt. for highly competitive demand and above the $25.17 price per cwt. under monopsony without packer feeding.

Packer Feeding under Oligopsony

Packer feeding by oligopsonistic packers--firms with a degree of oligopsonistic market power--can affect market pricing, but to a lesser degree than with monopsony. Packer feeding allows the oligopsonistic packer to restrict market purchases, while still operating his plant at capacity, as was also true under perfect competition and monopsony. Ordinarily, these flexibilities conferred by large-scale packer feeding upon an oligopsonistic packer would be expected to affect the local market price, but to a less extent than under monopsony. Entrance into feeding by oligopsonistic packers is very likely to result in a downward bias in a local market price, away from an oligopsonistic price without packer feeding and further away from a competitive level.

One way of looking at the market effect of packer feeding under oligopsony (or any other demand structure) is to regard the substitution of packer-fed cattle for market purchases as a reduction in demand for market cattle. This is what it amounts to. Drawing on a packer's own cattle shifts the demand curve of the firm to the left depending upon the number of packer-fed cattle transferred to plant. As the demand curve of the firm for cattle is shifted to the

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[4] Graphic analysis of oligopsonistic markets, complete with equilibrium solutions for individual firms (showing demand and MSC curves of individual oligopsonists), is not undertaken here. Rather, a graphic solution is shown for an oligopsonistic market only.

MARKET PRICING OF CHOICE SLAUGHTER STEERS
UNDER OLIGOPSONY, WEEKLY TRADING

PRICE/CWT.

Supply

Competitive
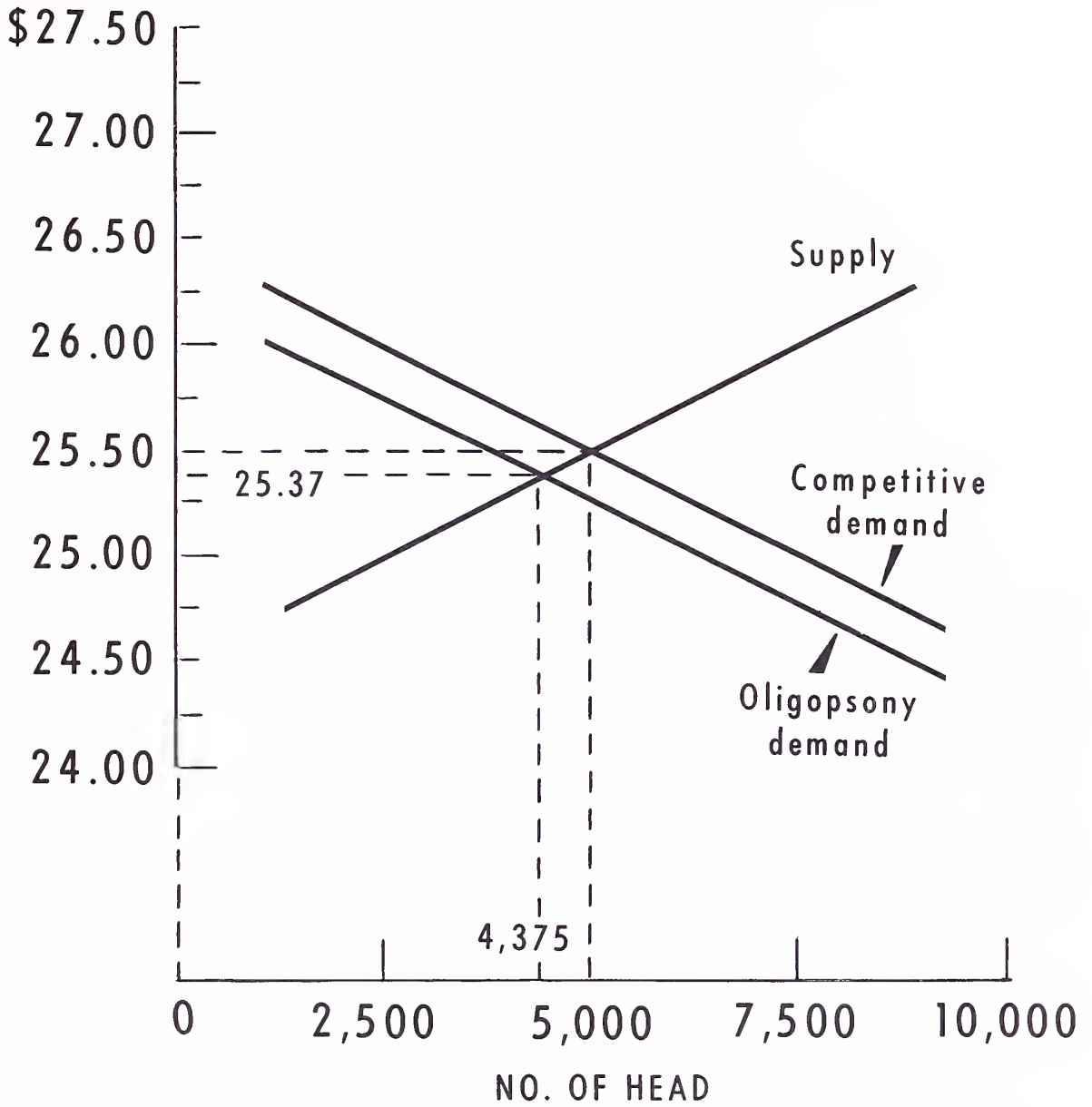demand

Oligopsony
demand

25.37

4,375

NO. OF HEAD

Figure D

left, it will pay lower prices for any given number of cattle. Or with similar effect, the firm will purchase fewer cattle at any given price.

When packer feeding significantly shifts the demand curve of an oligopsonistic packer to the left, the market demand curve is shifted to the left as well. The result is lower prices offered at the market, and a lower equilibrium price, given the market supply curve.

In Figure E, two demand curves are shown for the oligopsonistic market. The upper curve indicates demand without packer feeding. It is the same oligopsony demand curve as in Figure D. The lower curve indicates a shift in demand when the oligopsonistic packers are also feeders. The new demand curve shows that the feeding packers, as a group, will buy fewer Choice steers at the market at any particular price.

The result is a new equilibrium price of $25.25 per cwt., as 3,750 head are traded each week. The reduced demand due to packer feeding has lowered the price by $.12 per cwt. below the oligopsony level without packer feeding ($25.37 per cwt.). Feeders supplying the market will partially counter the lower price with reduced shipments, as the sloped supply curve indicates. But unless the market supply curve is perfectly elastic--as it never is--reduced shipments will not fully compensate for the reduced demand.

Power of oligopsonistic feeding packers is neither absolute nor unlimited, and it may or may not be exploited regularly. But it is present. Such a packer is capable of forcing price not only lower than the price in a competitive setting, but lower than the price in an oligopsonistic market in which packer feeding is absent.

Special Aspects of Packer Feeding at Public Markets

Animals sold at terminal public markets (and at auctions) are shipped to market on the basis of anticipated prices rather than actual or realized prices. Once the animals have reached the market, supply is essentially fixed. Animals are seldom held over for later trading, trasferred to other markets, or returned to the feedlot as the result of low prices. On the other hand, if market supplies are below normal as trading begins, it is difficult for additional supplies to enter the market during the trading period.

This fixed-supply phenomenon, characteristic of public markets, gives an essentially vertical supply curve for the trading day. Over a moderate price range, supply is very inelastic or even absolutely so (giving a vertical supply curve). Over the price range for which supply is perfectly inelastic, demand alone sets the price. If there is any weakness in demand, it is transformed entirely into reduced price at the market inasmuch as supply is fixed.

It follows from this that without forewarning a market, a large buyer could substitute a large number of packer-fed cattle for his normal purchases on a particular day and depress the market price. The packer in this event would be in a very strong bargaining position in buying any remainder of needed supplies. The market demand curve shifts to the left and the result is a lower price on the market for the volume of cattle on the market. A large number of packer-fed cattle may shift the market demand curve to the left on a particular day to such a degree as to lower the price by possibly $.25 or $.50 per cwt., compared to earlier trading or prices at other markets.

In Figure F, we have the supply and demand relationships for trading of Choice steers at a terminal public market where trading is on a daily basis.

The sloped supply curve indicates the numbers of cattle that feeders will ship to market for Monday sale as they expect various prices. The upper demand curve indicates the market prices that will result when packers at the market bid for and buy various quantities delivered for sale at the market. There are large packers, oligopsonists, buying at the market, but none is sending his own cattle to slaughter.

MARKET PRICING OF CHOICE SLAUGHTER STEERS
UNDER OLIGOPSONY, WITH AND WITHOUT
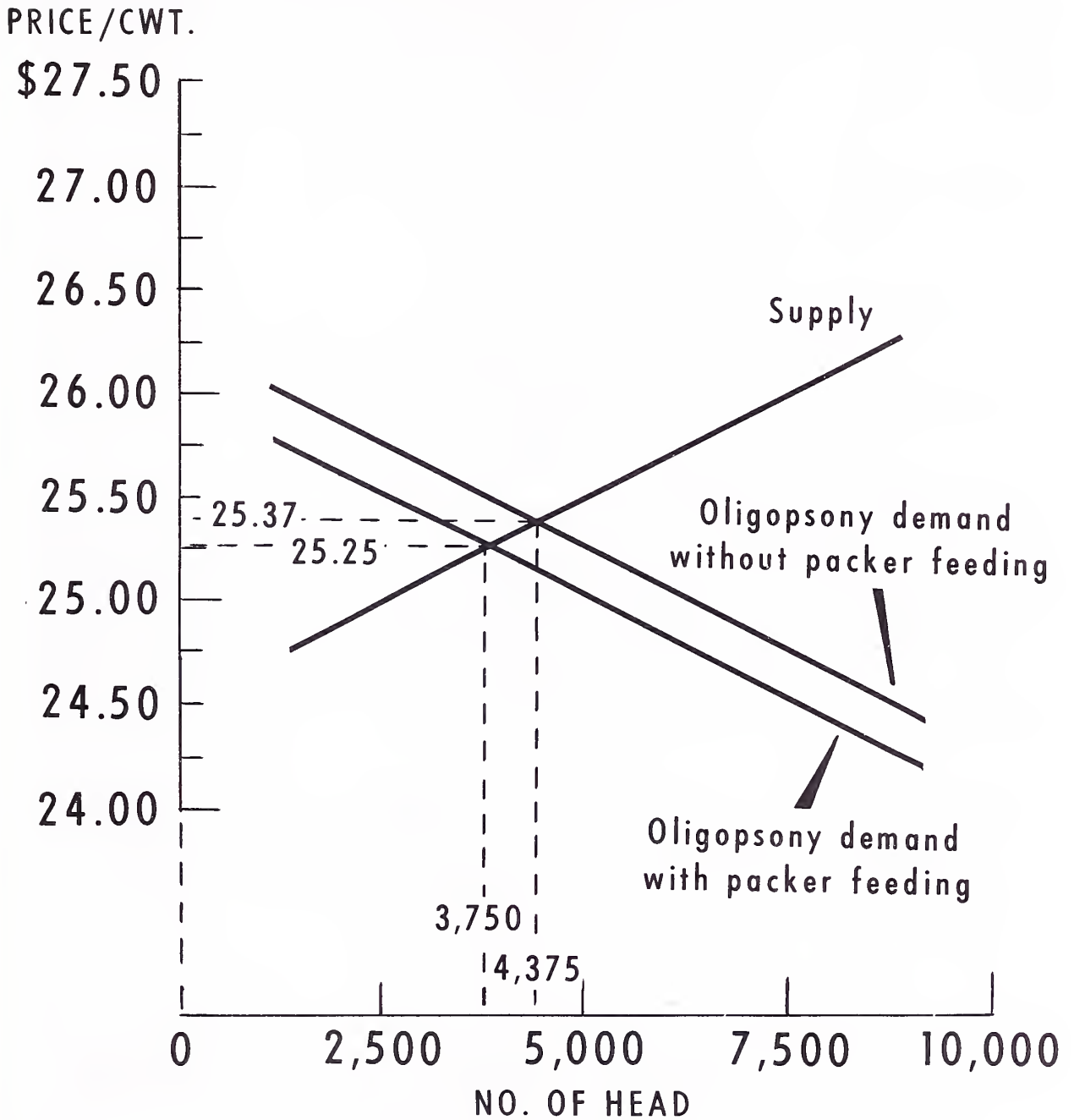## PACKER FEEDING, WEEKLY TRADING

Figure E

PRICING OF CHOICE SLAUGHTER STEERS UNDER OLIGOPSONY
AT A PUBLIC MARKET WITH AND WITHOUT
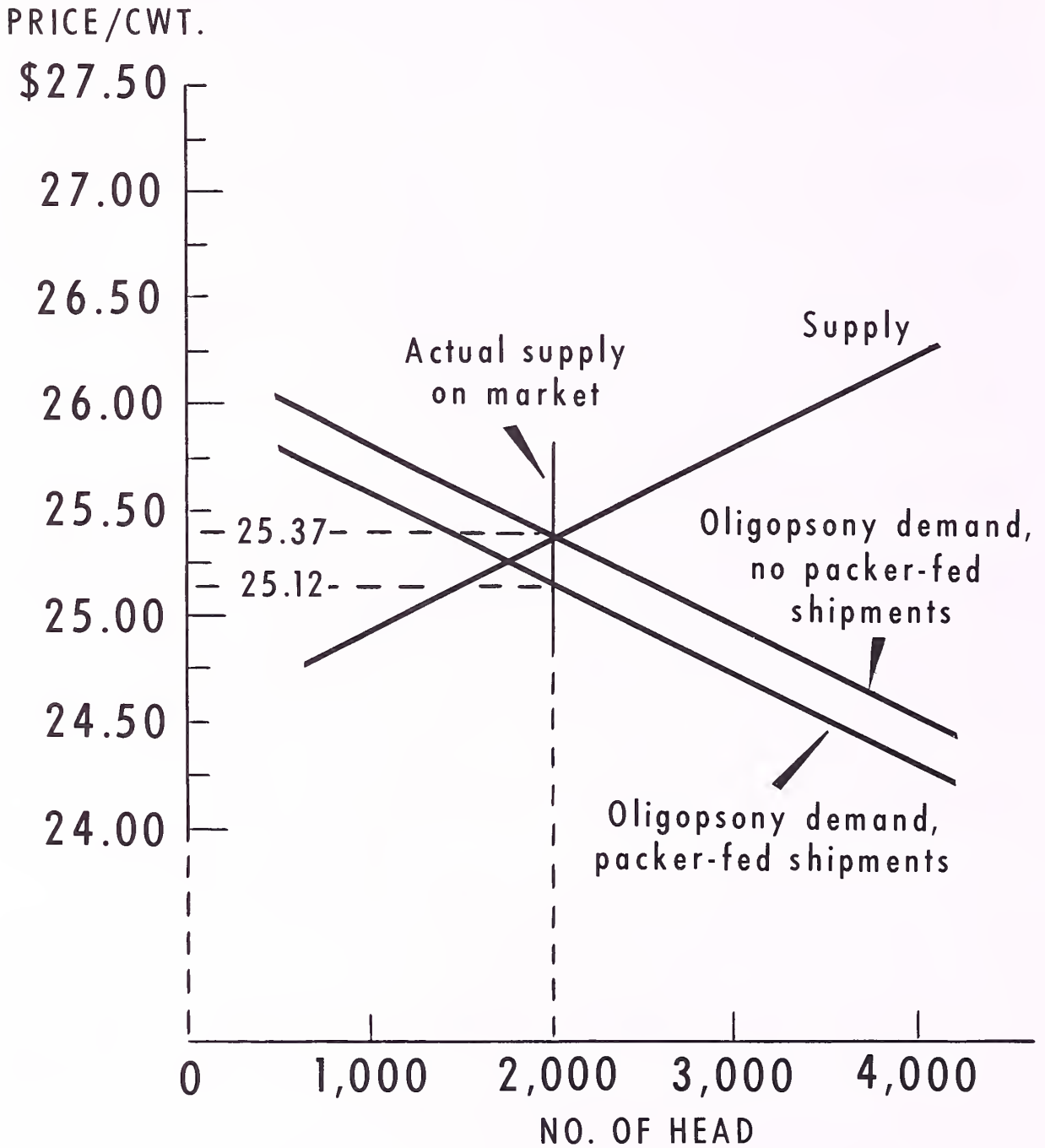PACKER FEEDING, MONDAY TRADING

Figure F

Under equilibrium conditions, feeders will expect a price of $25.37 and will ship 2,000 head of Choice steers to market. Once they have done so, and this volume of cattle is on the market (and must be cleared at some price), the relevant supply curve for that day now is the "actual supply" curve in Figure F. This very short-run supply relationship is essentially a vertical line within a given range of the expected price of $25.37 per cwt. With supply essentially fixed, demand is left to determine price. Given the demand curve, the price will be $25.37, and the market is in equilibrium.

If one of the oligopsonistic packers should suddenly decide to substitute 500 head of his own fed animals for market purchases, a sharp impact would follow. The result is a shift to the left in the market demand curve to the lower position in Figure F. Producers and the market itself were not forewarned of this intention and again 2,000 head were shipped to market in anticipation of the equilibrium price of $25.37. The very short-run supply relationship (i.e., actual supply) is still appropriate. But now the relevant demand curve (reduced demand) intersects the actual supply curve at a lower level and the price is reduced by $.25 per cwt., or to $25.12. Had producers known this were to be the case (a price of only $25.12), they would have shipped fewer steers to market.

The essence of the above analysis is that a public market is particularly vulnerable to temporary shifts in demand due to packer feeding because supply is essentially fixed for the trading day. The large feeding packer is in a strong bargaining position in taking additional supplies from the market because animals on the market already are committed to sale. It is difficult for feeders selling at a market to know when demand may be reduced by transfers of large packers. By the time they find out, they have already shipped.

This analysis of trading on a daily basis only extends the demonstration in Figure E, which applied to weekly trading. During the course of a week, shippers have an opportunity to adjust their shipments to some extent. Consequently, the supply curve has a slope. But at a public market, prices are made on a daily basis.

The cattle feeder selling at a major public market commits his animals for sale when he ships them to a market some distance away. Price is determined only after the animals have been delivered. High price or low, the seller has committed his supply with limited recourse. In this situation, he is peculiarly vulnerable to any weakness in demand arising out of oligopsony market leverage due to packer feeding.

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