# Effects of Specials on Composite Meat Prices

By Lawrence A. Duewer

Retail grocery stores usually advertise and sell a selected group of meat and other items at special reduced prices each week. The purpose of the study reported here was to determine the effect that these specials have on the average composite price paid by consumers for beef and for pork. The term composite refers to the value or average price of the entire carcass at retail; it represents the combined contributions of all the individual retail cuts from the carcass that are purchased by consumers. Specifically, specials decrease the retail price, and the effect of specials sought in this study is the decrease in the composite price paid by the consumer as a result of specialing practices.

Concern about the effect of specials has been mounting. Questions involved are directed at how large the effect of specials actually is and whether published price series are accurately and adequately reflecting this lowered composite price resulting from meat specials. Retailers feel published prices are too high, causing the wholesale-retail price spread imputed to retailers to be overstated. The National Commission on Food Marketing examined this question and concluded that USDA overstated the average retail price of Choice beef by 7.0 cents per pound and pork by 4.1 cents per pound in 1964.[1]

This paper describes procedures for arriving at volume-weighted composite prices for beef and pork. Similar procedures may be applicable to specialing of other products and to obtaining accurate yearly average prices for seasonal products. For example, some fruits and vegetables carry lower prices and sell in greater volume when in seasonally heavy supply. A weighting of price by volume each month would give a more accurate average price for the year than just an average of the monthly prices.

## Data Available

Retail meat price sources commonly used are the prices of individual cuts published by the Bureau of Labor Statistics (BLS) and the beef and pork composite Market Basket prices published by the USDA. As BLS prices are used in the Market Basket computations, considerable attention has been directed to determining the accuracy of the BLS figures. Through pricing a larger proportion of chainstores on Thursday, BLS has been able to reflect more special prices than it formerly did.

A retail meat price survey conducted by the Marketing Economics Division (MED) of the Economic Research Service collects both regular and special prices on a weekly basis. This survey includes about 40 retail chain divisions throughout the United States.

Both the BLS and the MED surveys, however, collect only prices. Neither gives any indication of the effect that the proportion of volume sold of an item while on special has on the composite meat price.

A study of the food chains in the Washington, D.C., area completed by MED personnel for the National Commission on Food Marketing provided both volume and price data for beef.[2] Further analyses of these data, collected during 1965, provided valuable information regarding how the total effect of specials can be separated into two effects.

---

[1] National Commission on Food Marketing. Cost Components of Farm-Retail Price Spreads for Foods. Tech. Study No. 9, Washington, D.C., June 1966, pp. 5-6.

[2] National Commission on Food Marketing. Organization and Competition in the Livestock and Meat Industry. Tech. Study No. 1, Washington, D.C., June 1966, p. 73.

## Theory of the Effects of Specials

Measurement of the total decrease in the average composite price of beef and of pork sold due to specials involves both a price and a volume influence. The price effect is the decrease in the composite value due to special prices, disregarding any changes in the volume moved due to specials. The volume effect is the additional decrease in value resulting from the greater-than-usual sales volume of a cut when on special.

Existence of the price effect is apparent immediately as the average price logically decreases when prices of some cuts are lowered. The volume effect is less obvious and requires some explanation. When a store places a particular cut on sale, the store may sell three, four, or even 20 times the volume it would have sold if the cut had remained at its regular price. As a result, during a specific week a particular store may not sell items in the proportion found in the carcass. Even if we assumed that all stores combined over time must sell in carcass proportions, we could not obtain an accurate composite price because we would not know what price to use. In fact, this is essentially the price we are seeking, but it can be obtained only by taking volume of movement into account. It is true that if stores never specialed meat items the regular prices of the various meat cuts might be somewhat different, but this study was undertaken because stores do use specials.

Retailers are able to make available larger quantities of a cut on special by buying an extra volume of the primal cut producing the particular cut or cuts they are specialing. Table 1 illustrates the existence of both a price and volume effect by using primal cuts in an example. The regular price composite value of $69.32 per hundredweight is computed using carcass cutting test proportions and regular prices. The composite value of $60.45 accounts for the total effect of specials by multiplying the regular and special prices by the percentages sold at each price. The bottom portion of the table indicates possible specialing plans of three firms and how a specials-included composite ($64.88) can be calculated using only price information (assigning equal weight to each store) and the proportion each cut is of the carcass. In this example, the total sold by the three firms is in carcass proportion and the true composite value obtained was $60.45 per hundredweight. The price effect was $4.44 per hundredweight and the volume effect $4.43. In this example an $8.87 per hundredweight decrease in the composite price resulted due to specials.

Data from the Washington study conducted for the National Commission on Food Marketing were used to obtain composite prices for beef similar to those in table 1: a regular composite, a specials-included composite, and a volume-weighted composite. The price effect contributed 4.08 cents and the volume effect 4.15 cents of the 8.2-cent-per-pound total effect of specials reported by the Commission (see footnote 2).

Replications of the Washington study in other areas and for pork were deemed necessary before any revisions were made in the procedures for calculating composite retail prices of beef and pork. This report indicates the procedures used and results obtained in this expanded study.

## Procedures

The five cities used in the expanded study were selected to reflect geographic variation, a sizable block of population, and centers of varying sizes. Cities selected were Philadelphia, Detroit, Chicago, Denver, and San Francisco.

All the large retail chains in each city were asked to cooperate. Only two firms that conducted a sizable portion of trade in their respective cities declined. Only one of the 12 largest chains in the United States declined to participate; three of these firms, however, were not asked to participate since they do not operate stores in the cities studied. A total of 20 chain divisions participated--three in Philadelphia, five in Detroit, five in Chicago, two in Denver, and five in San Francisco.

A period of 6 months was selected to gather data. This period was long enough to eliminate abnormalities in data caused by holidays or unusual special programs, without overburdening participating firms. Data were collected in Philadelphia from October 1967 through April 1968, and in the other cities from November

Table 1.--Example of volume effect of specials

| Item | Proportion of carcass | Regular price | Value if sold in carcass proportions | Total specials effect of all meat sold | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | % sold on special | % sold regular | Special price | Total value special | Total value regular |
| | Percent | Dollars | Dollars | Percent | Percent | Dollars | Dollars | Dollars |
| Round.............. | 16.6 | .90 | 14.94 | 14.0 | 2.6 | .70 | 9.80 | 2.34 |
| Rump.............. | 6.9 | .70 | 4.83 | 3.0 | 3.9 | .55 | 1.65 | 2.73 |
| Sirloin............ | 11.4 | 1.00 | 11.40 | 10.0 | 1.4 | .75 | 7.50 | 1.40 |
| Flank............. | 2.8 | .65 | 1.82 | -- | 2.8 | -- | -- | 1.82 |
| Short loin........ | 8.5 | .85 | 7.22 | 2.0 | 6.5 | .75 | 1.50 | 5.52 |
| Short plate....... | 7.8 | .35 | 2.73 | -- | 7.8 | -- | -- | 2.73 |
| Rib............... | 9.2 | .80 | 7.36 | 6.0 | 3.2 | .65 | 3.90 | 2.56 |
| Brisket........... | 5.1 | .45 | 2.30 | -- | 5.1 | -- | -- | 2.30 |
| Shank............. | 3.6 | .35 | 1.26 | -- | 3.6 | -- | -- | 1.26 |
| Sq. cut chk. ..... | 28.1 | .55 | 15.46 | 20.1 | 8.0 | .45 | 9.04 | 4.40 |
| Total........... | | | 69.32 | | | | 33.39 | 27.06 |
| True composite.. | | | | | | | 60.45 | |

Total sold could be divided among three firms specialing as follows:

| Item | Firm #1 | Firm #2 | Firm #3 | Specials-included | | Value with carcass proportions[a] |
|---|---|---|---|---|---|---|
| | | | | How obtained | Price | |
| Round.............. | Special | Regular | Regular | .70 + .90 + .90 ÷ 3 = | .83 | 13.78 |
| Rump.............. | Regular | Special | Regular | .70 + .55 + .70 ÷ 3 = | .65 | 4.48 |
| Sirloin............ | Regular | Regular | Special | 1.00 + 1.00 + .75 ÷ 3 = | .92 | 10.49 |
| Flank............. | Regular | Regular | Regular | .65 + .65 + .65 ÷ 3 = | .65 | 1.82 |
| Short loin........ | Special | Regular | Regular | .75 + .85 + .85 ÷ 3 = | .82 | 6.97 |
| Short plate....... | Regular | Regular | Regular | .35 + .35 + .35 ÷ 3 = | .35 | 2.73 |
| Rib............... | Regular | Special | Special | .80 + .65 + .65 ÷ 3 = | .70 | 6.44 |
| Brisket........... | Regular | Regular | Regular | .45 + .45 + .45 ÷ 3 = | .45 | 2.30 |
| Shank............. | Regular | Regular | Regular | .35 + .35 + .35 ÷ 3 = | .35 | 1.26 |
| Sq. cut chk. ..... | Regular | Special | Regular | .55 + .45 + .55 ÷ 3 = | .52 | 14.61 |
| Total........... | | | | | | 64.88 |

[a] Percent of carcass X specials-included price.

69.32-60.45 = 8.87--Total effect
69.32-64.88 = 4.44--Price effect
64.88-60.45 = 4.43--Volume effect

1967 through May 1968. Philadelphia was started a month earlier to provide a test of procedures and methods.

Each cooperating firm supplied cutting tests used (percentages of each cut in the carcass), regular prices for each week, special prices for each week, and volume of movement each week. The specific method of providing this information varied somewhat from firm to firm in relation to their normal accounting procedures. In all cases, however, the information desired was available from material supplied. Pork cutting tests supplied were usually limited to ham and loin tests; the remainder of the cutting test percentages used were uniform for all firms.

Data used from each firm consisted of prices and volume of movement for fresh beef, which in most cases was Choice grade, and fresh and smoked pork. Canned pork was not included; however, prepackaged smoked pork items were included.

Regular and special prices could be used directly as supplied. Volume figures had to be divided into individual cut amounts from the pounds of carcasses or primals and other cuts purchased by the firm. Thus, the carcass cutting tests supplied by each firm were used in two ways. First, the firm's overall beef and overall pork cutting tests were determined for use in obtaining the regular and specials-included composites. Individual breakdowns of each primal or cut purchased were needed in addition to the overall or carcass cutting tests to obtain the volume moved of each cut. If a firm purchased 1,000 pounds of round as an extra primal, this had to be divided among the round cuts in addition to the pounds of these cuts obtained from halves and quarters.

Tables 2 and 3 are examples of the worksheets used for beef and pork to summarize data for each firm each week. These tables show calculations for one firm for one week. The regular prices are as quoted for that week by that firm. The regular and special prices column was obtained by listing special prices for all items specialed that week by the firm, and then filling in the regular prices for all nonspecialed items. The sum of the multiplication of each item in the regular price column by the corresponding value in the carcass weights column (the overall cutting test) provides the regular composite value entered at the bottom of the regular price column. A similar computation using the regular and special prices column and the carcass weights column provides the specials-included composite value entered at the bottom of the regular and special prices column. The volume-weighted composite listed at the bottom of the actual pounds sold column is obtained by dividing the sum of the products obtained by the multiplication of regular and special prices and the actual pounds sold (table 2--119,260.26) by the total pounds sold (table 2--172,123).

Procedures differ in converting the composite values of beef and pork to a price per pound sold at retail. For beef, the cutting tests assign the weight of fat, bones, and waste to their respective categories, and carcass composite values are obtained which have to be converted to a retail weight equivalent. This conversion procedure is outlined at the bottom of table 2. In the case of pork, the weight of fat, bone, and shrink are not included in the total pounds figure, and the composite values are computed directly on a retail weight basis. This difference in procedure resulted because retailers can sell the fat and bones from beef for 3 cents and 1 cent per pound, while pork fat and bones have no value. The percentage loss of weight in pork at retail for these items in most cases is quite small. The main poundage loss in pork occurs prior to the retail level since retailers buy pork already divided into parts of the carcass.

Price and volume effect computations are also shown in tables 2 and 3. The price effect is obtained by subtracting the specials-included composite from the regular composite. This difference is always positive, except that it is zero when there are no specials. The volume effect is obtained by subtracting the volume-weighted composite from the specials-included composite. This difference is usually positive, but not necessarily. If a high-priced cut is on special and a large amount is sold, the volume effect may be negative. Also, if a store ordinarily sells a greater proportion of high-priced cuts (bought as primals), the volume-weighted composite may be higher than the specials-included composite.

Table 2.--Example of beef worksheet for a specific store for a specific week

| Item | Item code | Regular price | Regular and special prices | Carcass weights | Actual pounds sold |
|---|---|---|---|---|---|
| | | $ per lb. | $ per lb. | Cutting test % | Lb. |
| Porterhouse, BI | 101 | 1.47 | 1.47 | 4.7 | 5609 |
| Club, BI | 102 | | | | |
| Club, BO | 103 | | | | |
| T-Bone, BI | 104 | 1.39 | 1.39 | 2.8 | 3286 |
| Sirloin, BI | 105 | 1.28 | 1.28 | 8.4 | 10028 |
| Round fullcut, BI | 106 | 1.08 | 1.08 | 4.7 | 7059 |
| Round top, BO | 107 | 1.28 | 1.28 | 1.2 | 1733 |
| Round bottom, BO | 108 | 1.28 | .98 | 1.2 | 1796 |
| Chuck, steak, BI | 109 | .78 | .78 | 2.3 | 3683 |
| Rib, BI | 110 | 1.18 | 1.18 | 2.7 | 5023 |
| Flank, BO | 111 | 1.38 | 1.38 | 0.5 | 1299 |
| Rib, roast, BI | 112 | 1.18 | 1.18 | 3.8 | 7066 |
| Rib, rolled, BO | 113 | | | | |
| Chuck blade, BI | 114 | .69 | .59 | 5.9 | 9458 |
| Chuck arm, BI | 115 | .85 | .69 | 3.0 | 4771 |
| Chuck roast, BO | 116 | .89 | .78 | 5.0 | 8119 |
| Sirloin/round tip, BO | 117 | 1.48 | 1.48 | 3.2 | 4385 |
| Eye round, BO | 118 | 1.48 | 1.48 | 0.9 | 1363 |
| Rump, BO | 119 | 1.18 | .98 | 3.4 | 5105 |
| Rump, BI | 120 | | | | |
| Plate, BI | 121 | .49 | .49 | 1.6 | 2511 |
| Short rib, BI | 122 | .59 | .59 | 1.6 | 2696 |
| Brisket, BO | 123 | 1.08 | 1.08 | 2.0 | 3424 |
| Brisket, BI | 124 | | | | |
| Ground beef | 125 | .59 | .48 | 12.5 | 40522 |
| Ground chuck | 126 | .88 | .88 | 1.4 | 2260 |
| Stew, BO | 127 | .89 | .89 | 3.1 | 4941 |
| Shin or shank, BO | 128 | | | | |
| Shin or shank, BI | 129 | .69 | .69 | 1.1 | 1760 |
| Kidney | 130 | .39 | .39 | 0.2 | 330 |
| Fat and suet | 231 | 003 | 003 | 12.0 | 17235 |
| Bones | 232 | 001 | 001 | 9.5 | 14831 |
| Shrink and waste | 233 | 000 | 000 | 1.3 | 1830 |
| Composites | | Cents per lb. | Cents per lb. | lb. | Cents per lb. |
| | | 77.552 | 73.517 | 172,123 | 69.288 |
| | | Regular | Specials-included | Total pounds | Volume weighted |

These statistics are on a carcass weight basis:
To convert to retail pounds
Weights for fat, bones and shrink are added
(12.0 + 9.5 + 1.3 = 22.8) and subtracted from 100 (77.2).
Then $\frac{100}{77.2}$ = 1.30 which is used as the conversion factor. Thus,

: 119,260.26
: Total
: lb. x vol.

77.552 x 1.30 = 100.8 ⎫
73.517 x 1.30 = 95.6 ⎬ Retail
69.288 x 1.30 = 90.1 ⎭ composites

Price effect 100.8-95.6 =
| 5.2 cents per lb. |
Volume effect 95.6-90.1 =
| 5.5 cents per lb. |

| Item | Item code | Regular price | Regular and special prices | Carcass weights | Actual pounds sold |
|---|---|---|---|---|---|
| | | $ per lb. | $ per lb. | Cutting test % | Lb. |
| Loin, Ctr. Chops | 101 | 1.19 | 1.19 | 2.4 | 4907 |
| Loin, Ctr. Rib Chops | 102 | 1.03 | 1.03 | 3.2 | 6556 |
| Loin, Ctr. Cut Chop | 103 | 1.09 | 1.09 | 3.0 | 6125 |
| Loin roast, rib end | 104 | .63 | .63 | 4.5 | 9187 |
| Loin roast, loin end | 105 | .69 | .69 | 4.1 | 8402 |
| No. 2 Chops | 106 | .67 | .67 | 1.2 | 2473 |
| Tenderloin | 107 | 1.39 | 1.39 | 0.8 | 1649 |
| Fat, bones, and shrink | 108 | 000 | 000 | | |
| Ham, butt end | 209 | .69 | .69 | 6.5 | 13563 |
| Ham, shank ends | 210 | .59 | .59 | 9.7 | 20248 |
| Ham, center slices | 211 | 1.29 | 1.29 | 3.5 | 7314 |
| Fat, trim and waste | 212 | 000 | 000 | | |
| Whole ham | 313 | .69 | .69 | 3.5 | 7314 |
| Butts | 414 | .59 | .49 | 9.7 | 38242 |
| Spareribs | 415 | .69 | .69 | 3.1 | 5674 |
| Sausage | 416 | .59 | .59 | 5.7 | 10176 |
| Neckbones | 417 | .27 | .27 | 2.0 | 3962 |
| Pigs feet | 418 | .29 | .29 | 2.0 | 4127 |
| Tails | 419 | .29 | .29 | 0.2 | 468 |
| Picnics | 420 | .49 | .39 | 12.1 | 33330 |
| Bacon, sliced | 421 | .83 | .75 | 19.2 | 46215 |
| Bacon, sq. | 422 | .59 | .59 | 3.6 | 6174 |
| Bones, shrink, and waste | 423 | 000 | 000 | | |
| Composites | | Cents per lb. | Cents per lb. | lb. | Cents per lb. |
| | | 70.532 | 66.816 | 236,106 | 64.781 |
| | | Regular | Specials- included | Total pounds | Volume weighted |

152,951.36
Total:
lb. x vol.

Price Effect 70.532 - 66.816 = 3.7 cents per lb.
Volume Effect 66.816 - 64.781 = 2.0 cents per lb.

The total effect of specials on the composite beef price in the table 2 example is a decrease of 10.7 cents per pound. In the table 3 example for pork the total effect of specials on the composite price was a decrease of 5.7 cents per pound.

## Results of the Expanded Study

Price and volume effects for both beef and pork were computed each week for each firm. Large variations occurred from week to week in each firm due to the number of items placed on special, the depth of the price cut used, the relative price of the item or items on special, and the purchase response by the consumer. Average price and volume effects for the period studied were calculated for each firm for both beef and pork. These provided an average or usual level of the price and volume effects for the firm. The levels obtained for different firms varied as expected, but this variation was less than the variation among weeks for the same firm. For instance, the beef volume effect for one firm for different weeks varied from -11.8 to +13.4 cents per pound while the range of variation among firms for the beef volume effect was -1.75 to +7.65.

Citywide price and volume effects were computed by weighting each firm by its share of the total sales in the city made by the firms studied.[3] These city averages are presented in table 4. Variation among cities is much smaller than among firms. The fact that some variation exists indicates why several cities with different characteristics were utilized in the study. An average of the cities provides a statistic that is expected to be reasonably accurate.

Overall study results are also presented in table 4. The total effect of specials on the composite value of beef for the study was 5.97 cents per pound with 60 percent contributed by the price effect and 40 percent by the volume effect. The volume effect was 0.65 times as large as the price effect. The total effect of

---

[3] Sales volume percentages per firm were computed from data obtained from Grocery Distribution Analysis and Guide, Metro Market Studies, Inc., Greenwich, Conn., 1968.

specials for pork in the study was 4.88 cents per pound. The price effect contributed 66 percent and the volume effect 34 percent of the total effect. The volume effect was 0.52 times as large as the price effect.

## Use of Results

Determination of the relative size of price and volume effects for beef and pork was the major goal of the study. The continuing survey conducted by MED determines the price effect of specials each week and each month. With the results of this study the volume-weighted composite can now be estimated. If the price effect for beef for a given period was 4.2 cents, it can now be multiplied by 0.65 to obtain a volume effect of 2.7. If the price (4.2) and volume (2.7) effects are added and subtracted from the regular composite the volume-weighted composite is obtained. For pork the value 0.52 is used.

Table 4.--Results of specials study

| Item | Beef | | Pork | |
|---|---|---|---|---|
| | Price effect | Volume effect | Price effect | Volume effect |
| | Cents per pound | | | |
| Philadelphia......................... | 5.07 | 2.75 | 2.87 | 1.49 |
| Detroit.............................. | 3.35 | 2.41 | 2.47 | 0.45 |
| Chicago.............................. | 3.94 | 1.15 | 2.95 | 1.83 |
| San Francisco........................ | 2.22 | 1.57 | 4.68 | 3.54 |
| Denver............................... | (a) | (a) | (a) | (a) |
| Average, 5 cities.................... | 3.61 | 2.36 | 3.22 | 1.66 |
| Volume effect/Price effect.......... | 0.65 | | 0.52 | |
| Total effect........................ | 5.97 | | 4.88 | |
| | Percent | | | |
| Percentage of total effect.......... | 60 | 40 | 66 | 34 |

[a] Only two firms cooperated in Denver.

## Problems Encountered

As in all research, this study encountered several problems and/or technicalities which had to be solved through assumptions or development of guidelines and procedures to handle specific situations. This does not mean the results obtained are inaccurate or in any sense less valuable. In practice, the shortcomings may well be offsetting.

Due to the use of only one cutting test per primal per store, a smaller-than-actual volume of movement might have been used when only one or two cuts per primal were specialed. A firm might well cut more steaks and fewer roasts from a round when steaks are specialed.

Some firms consistently sold a larger proportion of higher or lower priced primals regardless of specialing programs. As pork is almost never purchased in carcass form, firms can easily adjust volumes of different cuts to demands. Pork is further complicated due to the exclusion of canned products in the study. In many cases, firms bought boneless beef to make additional hamburger. Relative prices may also allow the use of other-than-usual trim to be ground for pork sausage. This is probably often true of picnics. The other-than-carcass-percentage volumes found for some firms were assumed to balance out as the values obtained for the different firms were combined.

Data obtained from some firms were more detailed than from others. Some firms sold cuts that were not included on their cutting tests (for example, family steaks, "his and her" steaks, etc.). Some firms provided weekend inventories and for others we had to assume inventories were the same each week. Some firms indicated first and end-of-week sales volumes and some did not. Firms may also have had distress specials in some stores and data on these were not provided.

Branded items, such as bacon, are sold at different prices and some brands may be on special and some not. A procedure for using price differences for these branded items had to be developed. Again, some firms gave volumes by brand and some did not.

## Implications and Conclusions

Results obtained definitely indicated that specials have a significant effect on composite meat prices of beef and of pork. The total effect of specials found in this study was a decrease of 5.97 cents per pound in the beef composite price and a decrease of 4.88 cents per pound in the pork composite price. Included in this decrease in value is a decrease resulting from the greater volume of movement when cuts are specialed. As a result, a specials-included price by itself does not reflect the total effect of specials. Thus, even if BLS collected all special prices (which is unlikely), they still would not reflect the total effect of specials. Similarly, the MED survey does not presently reflect the total effect of specials, but data computed can be used with results reported in this study to obtain an estimated volume-weighted price.

An important verification of this study is that a volume effect does exist over time for all stores combined. Since net volume effects over time are not zero, present published series are not accurate in that they do not reflect the volume-weighted or actual price paid by the consumer and received by the retailer.

Results indicate that the ratio of the volume effect over the price effect is smaller for pork than for beef. This does not necessarily imply that the volume response to pork specials is smaller than for beef specials, although this may be the case. The fact that most pork specials are on the higher priced cuts may have a tendency to raise, rather than lower, the volume-weighted composite in more cases than for beef.

Considering the various effects that the problems mentioned might have had on the results, it seems more likely that the size of the volume effect is understated rather than overstated.

## Problems Encountered

As in all research, this study encountered several problems and/or technicalities which had to be solved through assumptions or development of guidelines and procedures to handle specific situations. This does not mean the results obtained are inaccurate or in any sense less valuable. In practice, the shortcomings may well be offsetting.

Due to the use of only one cutting test per primal per store, a smaller-than-actual volume of movement might have been used when only one or two cuts per primal were specialed. A firm might well cut more steaks and fewer roasts from a round when steaks are specialed.

Some firms consistently sold a larger proportion of higher or lower priced primals regardless of specialing programs. As pork is almost never purchased in carcass form, firms can easily adjust volumes of different cuts to demands. Pork is further complicated due to the exclusion of canned products in the study. In many cases, firms bought boneless beef to make additional hamburger. Relative prices may also allow the use of other-than-usual trim to be ground for pork sausage. This is probably often true of picnics. The other-than-carcass-percentage volumes found for some firms were assumed to balance out as the values obtained for the different firms were combined.

Data obtained from some firms were more detailed than from others. Some firms sold cuts that were not included on their cutting tests (for example, family steaks, "his and her" steaks, etc.). Some firms provided weekend inventories and for others we had to assume inventories were the same each week. Some firms indicated first and end-of-week sales volumes and some did not. Firms may also have had distress specials in some stores and data on these were not provided.

Branded items, such as bacon, are sold at different prices and some brands may be on special and some not. A procedure for using price differences for these branded items had to be developed. Again, some firms gave volumes by brand and some did not.

## Implications and Conclusions

Results obtained definitely indicated that specials have a significant effect on composite meat prices of beef and of pork. The total effect of specials found in this study was a decrease of 5.97 cents per pound in the beef composite price and a decrease of 4.88 cents per pound in the pork composite price. Included in this decrease in value is a decrease resulting from the greater volume of movement when cuts are specialed. As a result, a specials-included price by itself does not reflect the total effect of specials. Thus, even if BLS collected all special prices (which is unlikely), they still would not reflect the total effect of specials. Similarly, the MED survey does not presently reflect the total effect of specials, but data computed can be used with results reported in this study to obtain an estimated volume-weighted price.

An important verification of this study is that a volume effect does exist over time for all stores combined. Since net volume effects over time are not zero, present published series are not accurate in that they do not reflect the volume-weighted or actual price paid by the consumer and received by the retailer.

Results indicate that the ratio of the volume effect over the price effect is smaller for pork than for beef. This does not necessarily imply that the volume response to pork specials is smaller than for beef specials, although this may be the case. The fact that most pork specials are on the higher priced cuts may have a tendency to raise, rather than lower, the volume-weighted composite in more cases than for beef.

Considering the various effects that the problems mentioned might have had on the results, it seems more likely that the size of the volume effect is understated rather than overstated.