Fed Cattle Pricing: Live and Dressed Weight

Clement E. Ward
Oklahoma State University

Ted C. Schroeder
Kansas State University

Dillon M. Feuz
University of Nebraska

Live weight pricing has been a common method of pricing fed cattle. A second method, dressed weight or carcass weight pricing, has increased in usage for higher quality cattle. This latter method is frequently referred to as pricing "in the beef." The objectives of this fact sheet are to discuss: (1) the general pricing process packers follow in determining bid prices for fed cattle; and (2) the steps followed in both live weight and dressed weight pricing. Both methods preceed what is referred to now as "grid pricing." Grid pricing is discussed in separate fact sheets.

General Pricing Process

In a general but basic sense, packers estimate their beef and byproduct sales, subtract slaughtering-fabricating costs and a profit target, and what remains is how much they can pay for fed cattle. All packers begin with a basic economic concept, that profit is total revenue minus total costs.

Profitability can be viewed on a per head basis. Total revenue per head is the sum of beef and byproduct sales. Total costs per head are all costs related to purchasing fed cattle and slaughtering-fabricating, including byproducts processing. Packers begin with a simple, basic profit equation and develop a bid price from that.

Research shows that fed cattle bids change with changing boxed beef prices (Ward, Koontz, and Schroeder). In addition, byproducts are an important revenue source for packers and clearly affect packer bids. Research has also shown that as slaughtering-fabricating plant size increases, average slaughtering-fabricating costs per head decline (MacDonald et al.), leading to different cost schedules and different bids from packers. One packer's bid may not differ from another packer's bid, depending on market conditions. For example, large numbers of cattle may be traded at nearly the same price during so-called "30-minute" periods for many weeks. However, when there is a relatively short supply of fed cattle, packers generally decrease their profit target and increase their bid price. Conversely, when there is a relatively large supply of fed cattle, packers generally increase their profit target and lower their bid price. While packers may identify a profit target, it is not always met. At times, packers experience losses but keep their plants open to continue filling customer orders and retain their labor force.

Importance of Costs and Volume Processed

Packers have control over several factors that affect their gross margins and profits. Two of these are the quantity of fed cattle purchased and costs of slaughtering-fabricating. Packers decide daily how many cattle to slaughter and how many cattle to purchase. That decision, in turn, directly affects a packer's utilization of slaughtering-fabricating facilities because the volume impacts per head plant costs.

For example, there is an inverse relationship between slaughtering-fabricating costs and profit. When slaughtering-fabricating costs increase, profit decreases. When slaughtering-fabricating costs decrease, profit increases. Two plants could have the same gross margin (for example, $100 per head) but different per unit processing costs. The plant with the lowest slaughtering-fabricating cost ($85 per head) will have the highest profit ($15 per head), while the plant with the highest cost ($95 per head) will have the lowest profit ($5 per head). Therefore, slaughtering-fabricating costs are particularly important to meatpacking profitability.

Live Weight Pricing Process

Packer pricing of fed cattle is a two-stage process. In the first stage, a head buyer determines a daily procurement policy or buy order. A buy order may remain constant for the entire day or may change during the day if market conditions change. The buy order is given to field level buyers. So in stage two, buyers execute the buy order as they purchase fed cattle from feedlots.

The first stage is similar to the general process of estimating a bid price. For example, assume a 1,250 pound animal that yields a 788 lb. carcass (dressing percentage of 63%). Assume the boxed beef price is $125/dressed cwt.; byproducts value is $8.50/live cwt.; slaughtering-fabricating cost is $90/head; and the profit target is $12/head. Then estimated revenue from boxed beef and byproducts is [($125)(7.88 cwt.) + ($8.50)(12.50 cwt.)] or $1,091.25/head. From that, subtract slaughtering-fabricating costs ($90/head) and the profit target ($12/head). Then divide by the hundredweights of live cattle (12.5 cwts.) to get an estimate of the bid price for fed cattle,

$79.14/cwt. The head buyer follows these steps in determining how much buyers can pay for fed cattle if all cattle in a pen are Choice quality grade, yield grade 1-3, with carcasses weighing 700-850 lbs., and no carcass defects.

Thus, the above process does not account for quality variation among cattle in the sale lot. Fed cattle bids need to be adjusted to consider quality variation. Table 1 shows the step-by-step process of developing a bid price for fed cattle on a live weight basis.

Table 1. Live Weight Price Bid Example.

For cattle weighing 1250 lbs.

STEP 1: Compute Adjusted Boxed Beef Price

"Projected" Boxed Beef Price (Ch 1-3, 700-850)		$125.00
Less Discounts:		
% Select x $ Discount	(50% x $6)	-$3.00
% YG4-5 x $ Discount	(5% x $15)	-$0.75
% Light/Heavy x $ Discount	(5% x $20)	-$1.00
Sum for Adjusted Boxed Beef Price		$120.25

STEP 2: Convert Boxed Beef Price to Liveweight Price

Adjusted Price x Dress %	($120.25 x 63%)	$75.76

STEP 3: Add Byproducts Value

Step 2 + $8.50/liveweight cwt.	($75.76 + $8.50)	$84.26

STEP 4: Subtract Processing Costs and Profit Target

$90.00/Head Cost (Slaughtering-Fabricating)		
+ $12.00/Head Profit Target		
= $102.00/Head ÷ 12.5 cwts	($84.26 - $8.16)	$76.10
Bid Price		$76.10/cwt.

Step 1: Packers begin by estimating or projecting the boxed beef price, assumed here to be $125/dressed cwt. They compute an adjusted boxed beef price which accounts for cattle quality differences from the base or standard type, assumed here to be Choice quality grade, yield grades 1-3, with 700-850 lb. carcasses. The cattle are estimated to be 50% Choice quality grade (50% Select); 95% yield grades 1-3 (5% YG4-5); and 95% of the carcasses weigh 700-850 lbs. (5% heavier or lighter than 700-850 lbs.). The Choice-Select price difference or price spread is $6/cwt.; yield grade 1-3 and yield grade 4-5 price difference $15/cwt.; and deviations above or below the 700-850 lbs. range, $20/cwt.

This step is similar to but not as detailed here as with grid pricing. In essence there, a base price is adjusted by a set of premiums and discounts for known carcass characteristics of the cattle purchased after they are slaughtered.

Step 2: The dressed weight adjusted boxed beef price is converted to a live weight price by multiplying by the expected dressing percentage.

Step 3: Byproducts value, usually quoted on a live weight basis, is added to the adjusted price from Step 2.

Step 4: The final step is to subtract slaughtering-fabricating costs plus a profit target. The long-run average profit in meatpacking is a 1% return on sales, which in this case is about $12/head.

Note the estimated bid price in Table 1 differs from the estimated price from the general process described just above the table. Since the pen of cattle for which the price was estimated did not consist of carcasses that were 100% Choice grade, 100% YG1-3, and 100% 700-850 lbs., the estimated price in Table 1 was lower than before. Quality attributes of the cattle caused the dressed value of the pen to be $4.75/cwt. lower, or $3/cwt. lower based on the live weight value.

With live weight pricing, packers typically pay transportation costs from the feedlot to the packer and subtract a standard 4% shrink from the feedlot weight of the cattle. Often feedlots offer the entire show list in a single transaction and a packer buyer may bid on the entire lot at the same price to save time and costs associated with cattle procurement, even though individual pen and animal values differ. Feedlots marketing a large number of cattle on a live weight basis have a similar incentive to market a large portion of the show list to a single buyer in one transaction.

Pricing cattle on a live weight basis appeals to some cattle feeders who want to maintain complete flexibility in cattle pricing until the transaction price is established. However, because meat quality and carcass dressing percentage are difficult to accurately predict on live animals, premiums and discounts paid on a live basis are generally not reflective of the true cattle value associated with the final product yield and quality. Therefore, higher quality cattle are often under valued and lower quality cattle often over valued when cattle are priced on a live weight basis (Schroeder and Graff).

Dressed Weight Pricing Process

The process for developing a bid price on a dressed weight basis is very similar to the process for developing a bid price on a live weight basis. Table 2 shows the step-by-step process with the same assumptions as in the live weight example.

Table 2. Dressed Weight "in the Beef" Price Bid Example.

For cattle weighing 1250 lbs.

STEP 1: Compute Adjusted Boxed Beef Price

"Projected" Boxed Beef Price (Ch 1-3, 700-850)		$125.00
Less Discounts:		
% Select x $ Discount	(50% x $6)	-$3.00
% YG4-5 x $ Discount	(5% x $15)	-$0.75
% Light/Heavy x $ Discount	(5% x $20)	-$1.00
Sum for Adjusted Boxed Beef Price		$120.25

STEP 2: Add Byproducts Value (on a dressed weight basis)

Step 1 + Byproducts value/liveweight cwt. ÷ Dress %		
[$120.25 + ($8.50 ÷ .63)] = ($120.25 + $13.49)		$133.74

STEP 3: Subtract Cost and Profit Target (on a dressed weight basis)

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 $90.00/Head Cost (Slaughtering-Fabricating)
+ $12.00/Head Profit Target
= $102.00/Head ÷ 7.88 cwts  ($133.74 - $12.94)       $120.80
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Bid Price $120.80/dressed cwt.

Step 1: This first step is the same as Step 1 in the live weight pricing example (Table 1).

Step 2: This step differs because the previous Step 2, conversion to a live weight basis, is not necessary for pricing on a dressed weight basis. Step 2 in this example is really Step 3 in the previous example with one exception. Byproducts value must be converted to a dressed weight basis before adding it to the adjusted price from Step 1.

Step 3: Here, Step 3 differs from the previous Step 4 only in that slaughtering-fabricating costs and the profit target are converted to a dressed weight basis before subtracting them from the Step 2 amount.

With dressed weight or "in the beef" pricing, payment is made based on the actual "hot" (before chilling) carcass weight. Cattle feeders typically pay transportation costs from the feedlot to the packing plant. Dressed weight pricing eliminates the risk to the feeder of the packer incorrectly estimating the dressing percentage. Research indicates that dressed weight prices *on average* are higher than live weight prices but not as high as grid prices (Feuz, Fausti, and Wagner). However, results will vary depending on carcass characteristics, the base price and premiums-discounts in the grid, and other factors. To compensate for probable errors in estimating dressing percentage with live weight pricing, packers bid slightly lower on live weight bids compared with dressed weight bids. Dressing percentage is difficult to accurately estimate for live animals. Therefore, generally, cattle with higher dressing percentage (higher than typical cattle in the market) will receive higher net revenue when sold on a dressed weight basis and those with lower dressing percentage will net lower revenue.

The incentives for packers to buy complete showlists and feedlots to sell complete showlists at one dressed weight price are the same as for live weight pricing. This practice reduces costs associated with procurement for the packers and marketing for the feedlots. However, it distorts market signals and tends to reward inferior cattle and penalize superior cattle by trading all cattle at one average price.

Summary and Conclusion

Packers' pricing process consists of two stages. The first stage sets a general pricing policy for the field level buyers. The second stage involves estimating cattle characteristics and then estimating the bid price. Live weight pricing is more common than dressed weight or "in the beef" pricing in some regions, especially in the southern plains. The two processes are similar but dressed weight pricing virtually eliminates the guesswork of estimating dressing percentage, since payment is based on actual dressed weight. Research shows prices *on average* are higher for dressed weight pricing than live weight pricing. For individual animals, which method results in a higher price depends on the expected relative to actual dressing percentage of the cattle.

References

Feuz, D.M., S.W. Fausti, and J.J. Wagner. "An Analysis of the Efficiency of Four Marketing Methods for Slaughter Cattle." *Agribusiness: An International Journal.* 9(1993):6 453-63.

MacDonald, J.M., M.E. Ollinger, K.E. Nelson, and C.R. Handy. *Consolidation in U.S. Meatpacking.* U.S. Department of Agriculture, Economic Research Service, AER 785, February 2000.

Schroeder, T.C. and J.L. Graff. "Estimated Value of Increased Pricing Accuracy for Fed Cattle." *Review of Agricultural Economics.* 22(2000):89-102.

Ward, C.E., S.R. Koontz, and T.C. Schroeder. *Short-Run Captive Supply Relationships with Fed Cattle Transaction Prices.* U.S. Department of Agriculture, Grain Inspection, Packers and Stockyards Administration, May 1996.