

Captive Supplies and Their Impacts



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Clement E. Ward

Professor and Extension Economist, Oklahoma State University

Ted C. Schroeder

Professor, Kansas State University

Use of so-called “captive supplies” in cattle procurement has been a major concern to many in the cattle industry in recent years. This fact sheet defines captive supplies, provides information on the level and trends in recent years, gives reasons why buyers and sellers use captive supplies, and reports on research attempting to determine their impacts.

Nature and Extent of Captive Supplies

Captive supplies refer to livestock which are committed to a specific buyer two weeks or more in advance of slaughter. The three most common types of captive supply methods include packer feeding, forward contracts, and exclusive marketing/purchasing agreements.

- **Packer feeding** - Packers purchase feeder cattle and place them on feed in packer-owned or commercial feedlots. When cattle reach slaughter weight and finish, packers transfer the cattle to their plant for slaughter. At the time cattle are transferred from the feedlot to the slaughter plant, cattle are priced by a transfer pricing formula or cost accounting price.
- **Basis forward contracting** - Sometime during the feeding period, a cattle owner and packer enter into a basis forward contract. A packer bids a futures market basis for the month cattle are expected to reach slaughter weight and finish. The feeder then has the option of determining when to price the cattle (i.e., select a futures market price). From that futures market price, a cash selling price is computed, based on the agreed-upon basis. Sometimes the contract settlement price (i.e., futures market price) is chosen when the basis contract is signed. If so, the basis, the futures market price, and the cash sale price are all discovered on the date the contract is signed. If not, the bid price (i.e., the basis) is discovered on the contract date but the contract settlement price and cash sale price are discovered at a future date.
- **Exclusive marketing/purchasing agreements** - Essentially, these are supply contracts in which the cattle feeder agrees to market fed cattle to a given buyer, usually for some specified time period. Price is typically based on a pre-arranged formula, normally consisting of

a base price with premium and discount adjustments to the base price to reflect differences in cattle quality.

Two elements are common to each form of captive supplies. First, meatpackers have a portion of their slaughter volume needs purchased weeks or months prior to the live-stock being slaughtered. These forward purchases enable meatpackers to plan cash market purchases and deliveries in coordination with purchases by captive supply methods. Second, captive supply transactions between sellers and buyers do not result in a cash price which can be included in public market price reports.

Captive supplies represented 22.5 percent of fed cattle slaughter on an annual basis for the four largest firms in 1996 and 22.2 percent for the 15 largest firms (Grain Inspection, Packers and Stockyards Administration 1997). Captive supplies are typically higher in Texas-Kansas-Colorado than Nebraska-Iowa. For some plants and some weeks the percent of slaughter may be 70 percent or more. But to have the annual average at 22.5 percent, captive supplies for some plants and some weeks must be 10 percent or less. Figure 1 indicates that the extent of captive supplies on an annual average basis has not varied greatly over the past several years.

Incentives to Use Captive Supplies

One point often overlooked in the discussions about captive supplies is why *both* sides of the market, both buyers and sellers, use them. *Both* parties to a captive supply agreement, in the case of forward contracts and marketing agreements or formula selling of cattle, must decide at the time the contracts or agreements begin that positive benefits will accrue to themselves. Table 1 summarizes potential incentives of cattle feeders and meatpackers to enter into particular captive supply agreements (Schroeder et al. 1997). Primary benefits to cattle feeders may include improved price risk management, access to more financing options, a guaranteed buyer for cattle, improved opportunity for carcass quality premiums, and reduced marketing costs. Packers' primary benefits include securing cattle slaughter needs so they can operate large packing plants near capacity, having more control over the type and quality of cattle to fill their plants, and reducing procurement costs.

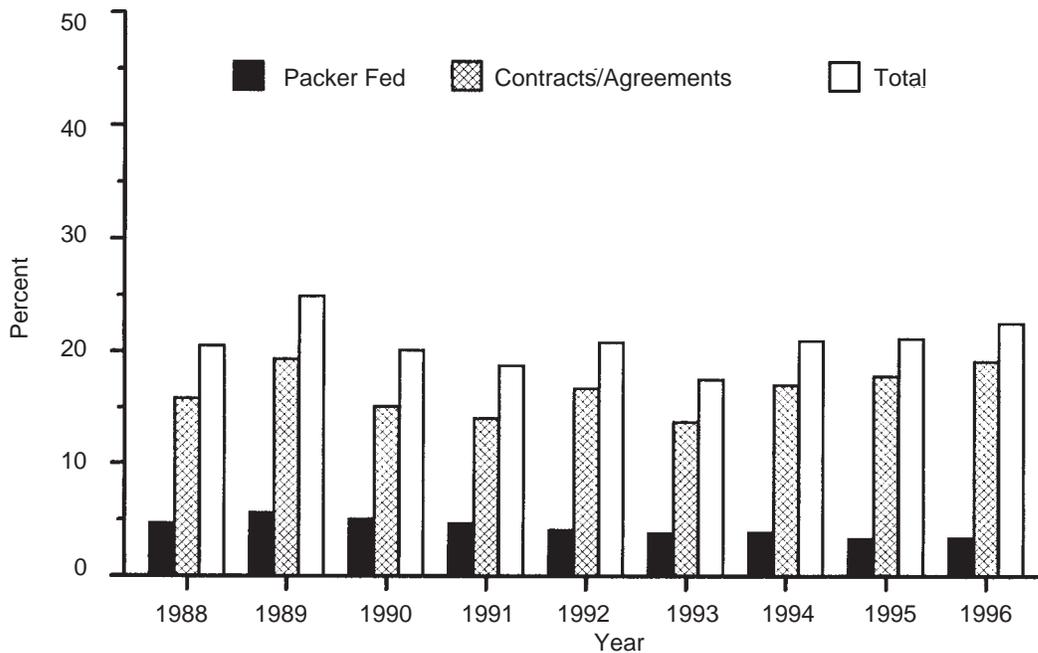


Figure 1. Captive Supplies for the Four Largest Beef Packers.

Captive cattle supply *can* contribute to overall efficiency in the beef marketing system. Reducing risks faced by cattle feeders and beef packers allows both parties to perform their economic activities of production and processing, respectively, at lower cost. Packers must operate near capacity to fully capture cost efficiencies of their large slaughter plants. When packers operate close to capacity, producers benefit because packers can pay higher fed cattle prices and consumers benefit because packers do not have to pass along higher fed cattle prices to consumers in the form of higher beef prices. Captive supplies enable packers to improve the timing of cattle deliveries to operate slaughter plants near capacity. However, research to date has not quantified beef packer efficiency gains associated with the use of captive supplies.

Cattle producers can use forward contracts to reduce their exposure to price risk. By pricing cattle in advance of

delivery, cattle feeders eliminate market risk, thereby allowing them to obtain favorable financing arrangements (Ward and Bliss 1989). Forward contracting shifts fed cattle price (or basis) risk from the cattle feeder to the beef packer.

Some captive supply agreements are also a step toward value-based marketing of live cattle. Captive supply agreements that contain price adjustments for varying carcass quality attributes provide cattle feeders increased incentives to produce cattle possessing desired quality characteristics. Most marketing agreement and/or formula-priced cattle are priced based on carcass grade and yield or other quality specifications. Beef carcass value-based marketing ultimately contributes to improved meat product quality and consistency and may strengthen retail consumer beef demand, helping beef compete more effectively with other meat products.

Table 1. Summary of Potential Incentives to Enter into Captive Supply Agreements.

<i>Method of Captive Supply</i>	<i>Cattle Feeder Benefits</i>	<i>Meatpacker Benefits</i>
Forward Contracts	<ol style="list-style-type: none"> 1. Reduce price risk if cattle are hedged or flat priced 2. Obtain favorable financing 3. Ensure a buyer for cattle 4. Reduce marketing cost 	<ol style="list-style-type: none"> 1. Secure slaughter volume needs 2. Increase cattle quality control 3. Reduce procurement costs 4. Reduce price risk
Marketing Agreements	<ol style="list-style-type: none"> 1. Premiums for some cattle quality characteristics 2. Obtain carcass information 3. Ensure a buyer for cattle 4. Reduce marketing costs 	<ol style="list-style-type: none"> 1. Increase cattle quality control 2. Secure slaughter volume needs 3. Reduce procurement costs
Packer-Owned Feeding	<ol style="list-style-type: none"> 1. Increase feedlot utilization 2. Improve packer to feedlot relationship 	<ol style="list-style-type: none"> 1. Secure slaughter volume needs 2. Increase cattle quality control

One motivation for packers is increased plant utilization and efficiency. Increased plant efficiency and lower plant operating costs *potentially* could mean \$0.20-0.30/cwt. higher prices paid for fed cattle.

The main point is that there are economic incentives for using captive supply marketing and procurement methods. Those economic incentives apply *both* to cattle feeders and meatpackers.

Captive Supply Impacts

Table 2 identifies concerns expressed by cattlemen regarding captive supplies. Perhaps of most importance to cattlemen is the possible impacts captive supplies have on competition and cash prices. When buyers purchase fed cattle by captive supply methods, the supply of cattle which can be purchased by other buyers is effectively reduced. That by itself would likely raise prices for the remaining cattle. Other buyers, those without captive supplies, need to bid more aggressively for a smaller supply of fed cattle. That, too, should put upward pressure on prices. However, it also means that those buyers which have captive supply cattle need not be as aggressive in the cash market because they already have a portion of their cattle requirements met. That in turn may cause them to be less aggressive in the cash market and cash prices may decline. The end result is not clear.

The captive supplies project of the Congressionally-mandated packer concentration study (Grain Inspection, Packers and Stockyards Program 1996) consisted of two components, one estimating long-run impacts from captive supplies (Barkley and Schroeder 1996) and the other estimating short-run impacts (Ward, Koontz, and Schroeder 1996). The objective for the long-run component was to identify the determinants for packers using contracts and marketing agreements. This was the first research attempting to measure the factors affecting packers' use of captive supplies. The short-run component consisted of multiple objectives and ap-

proaches, but the overriding objective was to estimate the impacts captive supplies had on cash transaction prices.

Special captive supply survey data were used to estimate those factors which affect how much a plant uses contracts and marketing agreements for fed cattle procurement. Transactions data were used for the short-run impacts study. Three approaches were taken to measure the effects of captive supplies on cash market prices. Models focused on the effects *deliveries* of captive supply purchases had on cash prices, impacts an *inventory* of captive supply purchases had on cash prices, and *differences* between prices paid by packers for fed cattle purchased by alternative methods, i.e., captive supply methods versus cash market purchases.

In examining monthly captive supply data, Barkley and Schroeder (1996) found that forward contracting (including here marketing agreement purchases) and packer feeding varied greatly among plants. Use of captive supplies was higher for larger plants compared with smaller plants. Average monthly captive supply purchases were nearly three times higher for larger than smaller plants (17,872 and 5,818 head per month, respectively, across all plants). Larger plants also had higher plant utilization than smaller plants. Use of packer feeding was relatively constant during the year, whereas use of forward contracts and marketing agreements was more variable, increasing in April, June, and December.

Results from a captive supply model suggested that larger plants use captive supplies strategically. Captive supply usage by larger plants increased as cash prices increased, but not by smaller plants. Captive supply usage increased as cash price variability increased, more so for larger plants than smaller plants. Captive supply usage also increased as plant utilization increased. Lastly, for larger plants, contracting and marketing agreements were substitutes for packer feeding. Therefore, in summary, larger plants used captive supplies to increase plant utilization and to mitigate rising or more variable prices. Cattle availability over the five-year data period did not affect captive supply levels.

No previous research recognized that decisions by packers to use captive supplies are made simultaneously with decisions of whether to purchase cattle in the cash market and how much to pay for cash market cattle. In one of the short-term impact approaches (Ward, Koontz, and Schroeder 1996), researchers found simultaneity in the decision to deliver forward contracted and marketing agreement cattle and the decision to purchase cash market cattle. The same simultaneity was not found for packer fed cattle. This suggests the reasons packers feed cattle are different from the reasons they use contracts and marketing agreements. Packer feeding may be motivated more by cattle feeding profit opportunities and maintaining a steady flow of cattle to the plant, and less by using packer fed cattle strategically to reduce procurement costs via its influence on cash market prices. As percentage deliveries from the inventory of forward contracted cattle increased by one percent, transaction prices (expressed in dressed weight terms) were found to decline by \$0.03-\$0.05/cwt. The range of price effects corresponds to several modeling approaches. Captive supply inventory periods of 14 days and 28 days were considered and some models included variables for individual plants while others used individual firms. A consistent negative relationship was also found for marketing agreement cattle. As the percentage delivery from the inventory of marketing agreement cattle

Table 2. Concerns Regarding Captive Supplies.

<i>Concern:</i>	<i>Cause:</i>
1. Lack of and reduced public market information	1. Captive supply arrangements are private negotiations between packers and participating cattle feeders. No mechanism exists to report prices or other conditions of trade.
2. Reduced competition for fed cattle	2. When packers have large percentages of slaughter secured by captive supply they may bid less aggressively for cattle in the cash market
3. Increased market power of packers holding captive supply cattle	3. Packers may maintain complete rights on timing of cattle delivery under captive supply

increased one percent, cash market transaction prices declined by \$0.10-\$0.41/cwt.

Another approach measured the impacts between the size of captive supply inventory and level of transaction prices. Results again were mixed. For the total inventory of captive supply cattle, results were consistently negative but small. Cash market transaction prices declined by \$0.01/cwt. or less as the inventory of captive supply cattle increased by 1,000 head. For forward contracted cattle, the cash market impacts were consistently positive; for packer fed cattle, the impacts were mixed; and for marketing agreement cattle, the impacts were consistently negative but small (\$0.01-\$0.04/cwt.).

The Ward, Koontz, and Schroeder (1996) study was the first to compare prices paid by packers among fed cattle procurement methods. Importantly, price differences were found among procurement methods. Compared with cash market prices, packers paid \$3.02-\$3.16/cwt. less (dressed weight prices) for forward contracted cattle over the one-year period. Packer-fed prices were about the same as cash market prices, and prices paid by packers for marketing agreement cattle were \$0.07-\$0.10/cwt. higher than for cash market prices. These results suggest cattle feeders pay a risk premium to packers for forward contracting cattle. And while not large, the higher marketing agreement prices may suggest that packers provide a small incentive to feeders for the higher quality or quantity of fed cattle they purchase via marketing agreements.

One point should be mentioned here. Many cattlemen do not believe the research results discussed above. However, the Congressionally mandated study was the most comprehensive study of captive supply impacts to date. For many cattlemen, the research results are counter to what they believe happens in the marketplace. These cattlemen could be correct. A significant weakness of the study by Ward, Koontz, and Schroeder (1996) was not being able to determine the impacts captive supplies had on prices in local market areas and for a short (one- or two-week) period. Thus, more work is needed.

Conclusions

Use of captive supply methods remained reasonably stable from 1988 to 1996, but are seasonal and can vary widely from plant to plant and week to week. Buyers and sellers use captive supplies for various reasons but must believe they are beneficial or they would not be used.

Research found that larger plants made greater use of captive supply procurement methods to keep plant utilization

high. Larger plants tended to use captive supplies strategically, i.e., increasing the use of captive supplies as cash market prices and price variability increased. Decisions to deliver cattle from an inventory of cattle purchased by captive supply methods and decisions to purchase cash market cattle were interrelated for marketing agreement and forward contract cattle. Price impacts from captive supplies were often negative, though small. A large price difference was found between forward contracted cattle and cash market purchases. Cattle feeders who forward contracted were transferring risk and paying a substantial risk premium to packers. A small price premium was received for cattle marketed under a marketing agreement with packers.

References

- Barkley, A.P., and T.C. Schroeder. "The Role of Captive Supplies in Beef Packing: Long-Run Impacts of Captive Supplies." C.E. Ward, T.C. Schroeder, A.P. Barkley, and S.R. Koontz. *Role of Captive Supplies in Beef Packing*. Grain Inspection, Packers and Stockyards Administration, U.S. Department of Agriculture, GIPSA-RR 96-3, May 1996.
- Grain Inspection, Packers and Stockyards Administration. *Concentration in the Red Meat Packing Industry*. U.S. Department of Agriculture, February 1996.
- Grain Inspection, Packers and Stockyards Administration. *Packers and Stockyards Statistical Report*. U.S. Department of Agriculture, February 1997.
- Schroeder, T.C., C.E. Ward, J. Mintert, and D.S. Peel. "Beef Industry Price Discovery: A Look Ahead." *Price Discovery in Concentrated Livestock Markets: Issues, Answers, Future Directions*. W.D. Purcell, ed. Blacksburg, VA: Research Institute on Livestock Pricing, February 1997.
- Slaughter Cattle Procurement and Pricing Team. *Price Determination in Slaughter Cattle Markets*. U.S. Department of Agriculture, Grain Inspection, Packers and Stockyards Administration, August 1996.
- Ward, C.E. and T.J. Bliss. *Forward Contracting of Fed Cattle: Extent, Benefits, Impacts, and Solutions*. Blacksburg, VA: Virginia Tech University, Research Institute on Livestock Pricing, Research Bulletin 4-89, November 1989.
- Ward, C.E., S.R. Koontz, and T.C. Schroeder. "Short-Run Captive Supply Relationships with Fed Cattle Transaction Prices." C.E. Ward, T.C. Schroeder, A.P. Barkley, and S.R. Koontz. *Role of Captive Supplies in Beef Packing*. Grain Inspection, Packers and Stockyards Administration, U.S. Department of Agriculture, GIPSA-RR 96-3, May 1996.