

ELECTRONIC MARKETING: ITS IMPLICATIONS FOR
BEEF CATTLE, SHEEP AND SWINE PRODUCERS^{1/}

By

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Introduction

My objective herein is threefold: 1) to review the concept of electronic markets and examine their applications and potential benefits and costs, 2) to summarize experiences to date in developing and implementing experimental electronic markets for livestock, and 3) to highlight some of the future implications that electronic marketing may hold for livestock producers.

Electronic Markets

There are many different perceptions of what is an electronic market. Indeed, there is no standard model unique design that characterizes this innovative marketing concept. Electronic marketing is still early in its evolutionary process. Thus, there are probably as many different concepts as there are attempts to experiment with and further develop this marketing technique.

Essentially, we are talking about things like tele-auctions, teletype auctions and computerized trading mechanisms. The main features include:

1) organized, auction-type selling among large numbers of buyers and sellers,

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2) remote access by traders to the market place. That is, buyers and sellers are typically at separate locations, many of which may be distant from the market, and 3) sales by product description rather than by personal inspection by potential buyers.

To clarify, let's take a hypothetical example for slaughter cattle. A feedlot operator selects those cattle ready for market, then prepares a description of those cattle that will allow potential buyers to assess their quality and estimate their potential value once slaughtered and processed into wholesale meat products. Such a description would probably include such things as the number of head, breed, sex, weight, quality and yield grades, age, length of time on feed and other relevant information. This information, perhaps along with a minimum acceptable price, is communicated to the electronic market. Similar information from numerous other sellers is also assembled.

At a designated time several buyers are contacted via remote tele-communications media such as telephones, remote computer terminals or other electronic devices. Descriptions of all consigned cattle are provided to the electronic assemblage of potential buyers. Subsequently, the cattle are auctioned to the highest bidders among those who are electronically connected into the market.

Tele-auctions are probably the most familiar of such markets. The tele-auction is very similar to a conventional auction in that an auctioneer personally conducts the sale. Potential buyers are connected to the market through a conference telephone arrangement, requiring individual buyers to have nothing more sophisticated than a telephone to become remote market participants. Each potential buyer is assigned an identifying number, used for entering bids. The auctioneer typically broadcasts a description of each

lot that is to be sold over the conference telephone network. He then begins his conventional chant to encourage sequentially higher bids from among the collection of buyers. Buyers bid by responding with their identification numbers to the auctioneer's price cries. When the auctioneer can conjure no bidder to advance the price further, the sale is awarded to the last or highest bidder. The auctioneer then completes arrangement for payment by buyer and delivery by seller.

The potential advantages of this type of marketing are rather obvious. A seller can access several potential bidders for his products without necessarily moving his products off the farm and thus, should receive more competitive prices. At the same time, he can gain many of the advantages of direct sales in that his livestock can remain on his farm until the sale is completed and then direct or nearly direct shipment to the buyer can be easily arranged. Thus, the advantages of efficient transportation, delivery of fresh livestock, reduction in handling, stress and shrink, and many of the other benefits of direct sales are maintained, while the pricing process moves from private, one-on-one negotiation between the farmer and an individual buyer to the competitive environment of the auction ring.

From the buyers' perspective, this system provides a "window to the marketplace" by letting them observe a large volume of market offerings without the physical costs associated with dispatching buyer representatives into the countryside to make on-farm inspections or to visit large numbers of country auctions. Also, the buyer gains the potential to procure needed supplies directly from large numbers of producers with the assurances of competitive prices and receipt of relatively fresh livestock.

Tele-auctions have become a common way of selling livestock in the U.S., particularly feeder pigs, feeder cattle and market lambs. These products are characterized by a number of factors which lend themselves to tele-auction marketing. First, they are typically marketed periodically rather than on a daily basis. That is, often there is not sufficient market volume in any given region to generate large volume daily sales. Thus, the telephone becomes a less expensive alternative to the auction yard for assembling buyers and livestock for sales that occur on a weekly or less frequent basis.

Second, production of these livestock is quite dispersed geographically and is often in relatively small units. Utilization of local auction yards is relatively low due to the small size and dispersion of individual marketings, and the cost of dispatching direct buyers is quite high. Thus, the cost of maintaining a network of local auction yards that is accessible to a large number of geographically dispersed producers is high relative to the use of the telephone auction system.

Thirdly, sales of many of these livestock, particularly feeder pigs and feeder cattle, are made to other farmers who typically are in the market less frequently and are purchasing smaller quantities than do packers who buy large volumes on a regular basis. This means that the buyer often cannot justify the cost of more sophisticated electronic communication devices than the telephone for participating in a remote electronic auction. All told, the tele-auction is a relatively simple electronic selling mechanism which appears to be well suited for the marketing of livestock that are produced in relatively small, geographically dispersed units and that are sold on a periodic rather than a daily basis.

Teletype auctions are somewhat more technologically complex versions of

tele-auctions. Using teletype equipment rather than telephones allows for printed rather than verbal communications, which reduces the possibility for error. It also facilitates more rapid and reliable communications among a large number of participants, and at a lower per unit cost when used on an ongoing or daily basis. It does require a bit more investment by users however, in that the auctioneer and buyers all need teletype repeaters. These are, essentially, electric typewriters connected together by Western Union-type telegraphy wires.

The Canadians have pioneered in the development of teletype marketing networks, primarily for conducting daily auctions of butcher hogs. The Ontario Pork Producers Marketing Board, in Toronto, has been the leader and has used a teletype auction for selling slaughter hogs in that province on a daily basis since 1961. Virtually all major meat packers that buy Ontario hogs have teletype repeaters in their offices that are connected to the master teletype machine located in the marketing board offices in Toronto.

Individual farmers throughout the province with hogs for sale contact the marketing board by telephone and provide a description of the hogs to be sold. The market operator then types out a description of the hogs on the teletype network which is instantly flashed to the teletype machines located in each buyer's office. The market operator then rings a bell on each of the buyer's machines which announces the beginning of the auction. The machine is programmed to conduct the auction sale. Each buyer teletype is fitted with a large red button which the buyers depress to enter a bid. The highest bidder is identified to the market operator who confirms the sale and proceeds to auction the next lot.

About four million market hogs are being sold in this fashion annually in Ontario with seven to nine active bidders typically involved in each sale.

Because sales occur on a daily basis and the packer-buyers are purchasing large volumes daily, the costs involved in the teletype system compared to a conventional conference telephone auction seem to be justified by the more rapid and reliable market operations.

Similar marketing techniques have been tried in two prairie provinces, Manitoba and Alberta, with less success primarily because of relatively low volumes of hog marketings in those provinces and insufficient numbers of packer-buyers to generate competitive bidding on individual sales. Both of those teletype marketing efforts have now been suspended.

More recently, the use of computers and remote computer terminals for conducting remote access electronic auctions has received considerable attention. Commercial developments have been pioneered in the U.S. cotton and egg industries. The basic concept is essentially the same as with telephone and teletype auctions. That is, large numbers of geographically remote buyers are connected through electronic communication media to a central auction market where large numbers of seller consignments are available for competitive sales.

There are several potential advantages of the computer network over either the telephone or teletype system. First, computers can handle large amounts of communications and data processing at extremely high rates of speed and with a very minimum risk of error relative to the number of transactions handled. This means that the potential to expand the size of the market is considerable, thus allowing larger numbers of sellers and buyers to interact in the same competitive environment. Secondly, computers can be programmed to perform a wide variety of market functions, thus expanding the number of trading options and the amount of descriptive and other market

information that can be conveyed among buyers and sellers. Third, the cost of computer equipment is falling rapidly with new technology, such as silicon microdot chips replacing the now archaic transistor.

It is now possible, for example, to put a remote computer terminal on an individual farm or in a packing plant that has sufficient electronic capability to handle sophisticated market transactions at a cost of less than \$80 per month. Computer main-frames suitable for driving large scale electronic markets now fit in a cabinet less than two feet wide, three feet deep and six feet high and cost less than \$200,000. Conventional dial-up telephone lines can now be used for reliable communications between computer terminals and main computers at speeds in excess of 2,000 characters per second. With modern computer technology, therefore, direct communication between the market, farmers, and buyers over a large geographic region is feasible. Because a large number of buyers and sellers can be accommodated, because a large geographic region can be covered, and because auctioning processes can be streamlined and automated, the computerized system lends itself particularly well to marketing large volumes on an ongoing, daily basis.

The first major application of computer technology to large scale competitive marketing in agriculture was in the high plains cotton industry. Plains Cotton Cooperative Association in Lubbock, Texas developed a computerized auction system for cotton, called Telcot, in 1975. That system has expanded steadily and now is a dominant marketing system for upland cotton in the United States. Individual farmers gain access to the market through remote computer terminals located in local cotton gins. Cotton merchants and other buyers have direct access to individual computer terminals. The market operates on a daily basis, allowing farmers to sell to the highest bidder in

a specified bidding period, or to offer their cotton at a firm asking price to any buyer on a take-it-or-leave-it basis. This system gives each cotton farmer virtually instant access to the competitive bids of as many as 45 potential buyers. In the last two years this system has expanded beyond the cooperative and has truly become an industry-wide market mechanism.

One of the more notable features of Telcot is its ability to routinely sell, on a description basis, cotton that includes some 6,000 different descriptive variations. Thus, the high speed data processing capability of computers has demonstrated its ability to accommodate highly specific and accurate descriptions of complex products. This capability to describe complex products may be one of the greatest assets of the computerized system relative to the less technologically-complex teletype and telephone auctions.

Another commercial venture in computerized marketing has been engaged by the Egg Clearinghouse, Incorporated in Durham, New Hampshire. This firm has for several years operated a clearing service for ungraded nest-run loose pack eggs, breaking stock and other egg products by matching bids to buy and offers to sell. They have utilized an in-house computer for recording bids and offers and making matches. In recent years they have extended remote computer terminals directly to major egg traders for direct trading access to their computer facilities. Essentially, this is a nation-wide network of egg traders who utilize remote computer terminals for trading non-contract eggs between producers and packers. The technical feasibility of operating that system on a daily basis is well proven. However, trading volume has only been marginally sufficient to support a sophisticated remote computer trading system, probably due to the relatively small volumes of uncommitted or non-contract eggs available for such trading. The ability to rapidly access

market information, however, has generally convinced egg traders of the value of that system despite relatively low trading activity.

Computerized Livestock Trading

Recently, several efforts have been made to encourage computerized trading of livestock, at least on an experimental basis. Each year the U.S. Congress appropriates a limited number of dollars for agricultural market improvement activities in the various states on a matching fund basis. Those funds are allocated by the U.S. Department of Agriculture upon request. In the past few years, three market improvement projects have been funded specifically for computerized livestock trading. These include market lambs and slaughter cows in Virginia, feeder cattle in Texas, and slaughter hogs in Ohio. I will review very briefly trading experiences in the Virginia and Texas experiments and elaborate in more detail upon experiences in the Ohio slaughter hog market, with which I am more closely involved.

The initial objective in Virginia was to develop an electronic market for slaughter cows. This market has been characterized by very small marketings from widely dispersed farmers with minimal competition among packer-buyers who rely almost entirely upon local order buyers for procurement. Attempts to generate electronic trading in that industry have been summarily unsuccessful to date, due in part to resistance from order buyers and due in part to the very dispersed nature of marketings and numerous complexities in accurately describing cull cows suitable for descriptive merchandising.

The Virginia project was expanded for development of a computerized auction to replace the tele-auction for market lambs that had been successfully used for several years. Weekly auctions for market lambs are now being held over a computerized network with considerable success. About 15 packer buyers are regular participants. The computerized system has resulted in substantial

savings in communication costs by reducing weekly auction time from 3-4 hours on the tele-auction to 20-30 minutes on the computerized auction.

The computerized feeder cattle auction which has been developed in Texas has not been particularly successful to date. There are several reasons but the bottom line is, we have not yet observed enough trading in that market to draw much in the way of conclusions.

By the time development of the computerized market was completed in late summer 1980, the prime feeder cattle marketing season was over due to the early movement of feeder cattle in Texas associated with last summer's drought. Thus, implementation did not correspond as well as planned with actual marketing. Additionally, there has not been a large market organization to provide support for the Texas feeder cattle system during initial stages of operation. Market support does appear to be of key importance to generating sufficient trading volume during start-up for adequate demonstration of the system's capability to potential industry users.

Another problem experienced in the Texas experiment has been the use of a reservation or no-sale price option for the seller in the electronic auction. It was felt initially that such a reservation price option was necessary to attract sufficient seller consignments. In practice, however, most consigners have fixed a reservation price that is sufficiently above the going market price to sharply curtail the number of actual sales completed on the system. That is, while bidding on individual lots has been fairly aggressive, relatively few sales have occurred as the highest bid price, while consistent with existing market conditions, has frequently been below the seller's reservation price. Thus, feeder cattle producers appear to be viewing this electronic market primarily as a means of discovering those isolated opportunities to sell at an appreciable premium over the going market, more so than as a mechanism for regular sales.

I can offer more detailed observations and insights from our experiences in selling slaughter hogs on a computerized market in Ohio. We began design and development of the computerized hog market in early 1979 with hopes of initializing daily sales by spring, 1980. Our intention was to design a computer network that included computer terminals at locations across Ohio and eastern Indiana convenient for farmers use in selling hogs, and buyer terminals located with 15-20 meat packers.

We designed a daily market that has hogs available for auction four hours each day and also provides farmers with the option of listing hogs for sale at a firm asking price. Included are both the familiar ascending or English auction and the less familiar but faster descending or Dutch auction procedures. Options exist for selling hogs while still on the farm as well as hogs delivered to assembly yards prior to listing for sale. Producers with fewer than 50 market hogs have been encouraged to deliver these to yards for commingling with other hogs into larger sale lots by setting 50 head as the minimum lot size for on-farm sales.

A grading system was devised, based on modified U.S.D.A. live hog grade standards. This includes five quality categories ranging from 1+ for the premium hog to 2- for the bottom line hog, and four weight categories ranging from 190-200 lbs. on the light end to 250-275 lbs. on the heavy end.

Most computer programming was completed by spring 1980. Remote computer terminals were deployed to 18 assembly yard locations around Ohio and eastern Indiana. Nine were installed directly on large hog producing farms. Seventeen were installed in packing plants for use by packer-buyers. Eight of these are in Ohio and most of the rest are in eastern states. The original computer software did not work as anticipated when a large number of trader terminals were being used. A substantial reprogramming venture was required. Finally,

after several abbreviated selling periods, regular daily sales began on November 10, 1980. Sales have occurred daily except holidays and weekends since then.

During the first six full weeks of operation over 40,000 head of market hogs were sold on this experimental electronic auction. The sales rate per day has averaged 1,435 head. This is roughly 40 percent of the targeted level (3,600 head per day average) which preliminary analysis indicates is a commercial feasible break-even volume. At the target volume, total marketing costs, exclusive of transportation, should be in the \$1.30-\$1.50 per head range. This compares to \$1.40-\$1.50 per head for selling in conventional auctions and \$1.75-\$2.00 per head for selling on terminal markets. At the volumes experienced to date, by contrast, total per head costs on the electronic market are in the \$2.50-\$3.00 range.

So far, there has been no discernable trend upward or downward in the number of head consigned for sale. My expectation was for an uptrend to be evident by this point in time. Thus, from my perspective, the lack of such a trend is a bit disappointing.

Actual trading results have been reasonably encouraging. There has been an average of almost eight actual buyers per day on the market. Fourteen of the 17 packers with computer terminals have been reasonably active as direct buyers. As many as ten different packers have been active bidders on a given lot. Thus, it seems safe to conclude that there is considerable competition among packer-buyers for hogs sold on this system.

In the typical daily market for hogs in Ohio most farmers have faced one or at most two potential buyers. Thus, with an average of about eight active buyers per day on the electronic market, farmers can quite easily access a larger number of potential buyers.

Prices at the Peoria terminal market make a logical comparison for prices in the Ohio hog market, given the predominant eastern movement of hogs from both areas. Traditionally, Ohio prices have averaged about 90 cents per cwt. below Peoria prices. Prices on the electronic market have averaged closer to 60 cents below Peoria, thus it would appear that about a 25-30 cents price gain has been realized. This probably reflects a combination of lower buying costs for packers because of the broader market access through the electronic market, and greater buyer competition which results in those costs savings being bid into producer prices.

Lots with 50 or more head have commanded an average 60 cents per cwt. premium over smaller lots. This seems to justify the use of 50 head as a cut-off for on-farm sales and provides a powerful economic incentive for farmers to commingle smaller lots of hogs with those of other sellers. Hogs sold while remaining on the farm have brought an average premium of 56 cents per cwt. over hogs delivered to the yard prior to sale. Thus, packers appear to be willing to pay a price premium for on-farm hogs, probably due to reduced stress on such hogs.

In terms of quality, the premium 1+ hogs have commanded an average of 43 cents above the market price while the lower quality 2+ grade hog has sold at an average discount of 15 cents. The bottom grade number 2- hog has sold at an average discount of \$1.20 while the average number 1 grade hog has sold right at the market average for all hogs.

Thus, the electronic market appears to be facilitating the competitive establishment of price differentials that reflect value differences associated with hog quality, handling conditions and lot size. It appears to be offering a viable competitive market alternative for the farmer who desires to merchandise hogs directly from his farm and who has sufficient volume to

market in that fashion. At the same time it is increasing the competitive market exposure for those farmers who, for reason of size or preference, deliver hogs to an assembly point prior to sale.

It also appears that the electronic market is more sensitive as an indicator of changes in market conditions. This is consistent with expectations, in that it is a highly visible market with broad buyer and seller participation. During the first six weeks of regular daily sales there were 13 notable changes in the direction of price movement in the eastern corn belt hog market. For six of these, changes in price movement on the electronic market occurred concurrently. But, changes in price trends on the electronic market led the overall market for five turning points and trailed for only two. This strongly suggests that the electronic market is an efficient mechanism for accurately establishing true market values in a dynamic market place.

Future Implications for Livestock Producers

I believe that the combined experiences of commercial telephone and teletype auctions and the experimental computerized marketing projects have demonstrated the technical feasibility of marketing livestock electronically. The economic feasibility and industry acceptability appear to be somewhat less certain at this point.

Economically, I am reasonably optimistic. It appears that electronic marketing provides a viable means for efficiently and accurately determining competitive market values for agricultural products. These markets also appear to facilitate access to market by relatively small and geographically dispersed producers. However, the pecuniary economic advantages associated with large scale marketings appear to be just as dramatic in an electronic market as in any other marketing system. Perhaps, the electronic market, at

least as implemented for slaughter hogs in Ohio, provides a viable mechanism whereby smaller producers can combine their marketings with others to achieve some of these pecuniary benefits. The extent to which producers will exploit these advantages is yet to be determined.

On the issue of marketing costs, with relatively large volumes of transactions the electronic market appears to be cost effective in comparison with other organized, competitive markets such as terminal markets and local concentration and auction yards. Again, it remains yet to be determined whether producers will sufficiently utilize electronic markets to generate the sales volume necessary to achieve these operational efficiencies on a regular basis.

The major unknown, in my mind, boils down to the extent to which the livestock industries in the United States desire to have a system of organized, competitive marketing and price establishment. Interest in electronic marketing by persons who are actively involved in competitive livestock marketing has been extensive, and has certainly exceeded my expectations. These include terminal market operators, commission firms, livestock marketing cooperatives, auction market operators, and many livestock buyers. Interest has been reasonably strong among many livestock producers who, by virtue of size, geographical location, or other reason have not had viable access to buyers for their products on a competitive basis. Interest by the mainstream livestock producer, and by this I mean the reasonably large scale commercial operator who has established trade channels with one or two regular buyers, has been less than overwhelming.

There are many indications, including the predominant trading practices of many of our large-scale commercial livestock producers, that point toward a future dominated by private treaty marketing and contract integration. These are the antitheses of organized, competitive marketing. There is the possibility

of adapting electronic marketing concepts to the determination of contract terms. That may be the direction in which our livestock marketing system will eventually evolve.

Focusing on the more immediate future, I believe that our experience has demonstrated that electronic marketing is a viable system for competitive marketing. It may be the only viable competitive marketing option, given emerging economic conditions in the livestock industries. The unanswered question is, do livestock producers have a sufficiently strong commercial commitment to the concept of competitive marketing to give electronic marketing a fair test vis-a-vis private deals and the contractual systems alternative?