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Food production will be revolutionized by e-commerce

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Introduction

- Can't pick up a newspaper or turn on a television set without running into e-commerce.
- B2C (business to customer), B2B (business to business), portals, and online exchanges are moving from Internet terminology to today's everyday business lexicon.
- Old world companies such as Smithfield Foods, Cargill, Dupont, Tyson, Farmland, and IBP are all moving quickly to adopt new age thinking and new age technology.
- Announcements relating to e-commerce in agri-food and agribusiness are coming weekly now.
- Since we moved into the new millennium old world companies and new age companies are moving to redesign the Ag-space with what—for now—seems an endless flow of Wall Street money.
- With the pork industry having lost \$4–\$5 billion of equity in 1998 and 1999, mostly on the production side, it's a good thing capital is available for the industry to re-tool on the marketing side.
- Information and knowledge can now flow at the speed of the Internet and potentially change the balance of power in the pork chain.
- Remember, not all will be happy with the new order. Information has long been the source of power for some and the source of weakness for others.

E-Commerce and the pace of change

The 90s proved to be a decade that brought a great deal of change to the agri-food industry in North America. Clearly, though, most of the changes came on the production side of agriculture. Great advances came through improvements in genetics, biotechnology, building and equipment design, animal health, food safety, animal handling, and transport. In effect, just about every area of pork production saw advancement. We can today produce more pork with a greatly diminished sow herd. We have also seen great efforts made to systematize the industry through development of vertically integrated and vertically co-

ordinated production. Much is made of these terms in the media and deeper analysis is required to understand where the Internet will play its greatest role going forward.

The pork industry simply cannot afford another supply and price debacle like it suffered in the last half of 1998 and the first half of 1999. Information flow, timely and accurate, could have prevented such a disaster.

One of the real benefits that will come with e-commerce and more co-coordinated production will be the ability to track production, thereby allowing the pork industry to become more self-regulating. Imagine being able to measure three simple numbers: pigs bred, pigs weaned, and pigs marketed. Knowing these numbers and tracking other meat competitor's inventories and production capabilities could empower the pork producers and processors to measure accurately supply against demand and thereby stabilize the marketplace. Integrators and producers in co-orientated systems need to know what others are doing. Misinformation transmitted throughout the marketplace will continue to impact margins negatively.

The scale of change

What is the scale of change in general, in agri-business, and—more specifically—food production?

E-Commerce, although a relatively recent phenomenon, is expected to reach a trillion dollars in sales by the years 2002–2003. It's growing at a rate unparalleled in business history. We've moved from early portals such as YAHOO(r) and AOL(r) to e-tailers such as AMAZON(r) and E-TRADE(r), to online auctions such as E-BAY(r) and BAND-X(r), and on to business-to-business platforms such as VERTICAL NET(r) and CHEMDEX(r).

Companies such as FARMS.com(r), EMERGE INTERACTIVE(r), XS-AG(r), DIRECT AG(r), and E-MARKETS(r) are rapidly developing online agri-business. Not to be outdone we are seeing old world Internet initiatives such as VANTAGE POINT(r), ROOSTER.com(r), and AG-WEB(r).

Internet adoption in the agri sector

When are we going to see some real change in the food production industry? Market efficiency requires a critical mass of buyers and sellers. Therefore, technical adoption rate in the agriculture community will be critical. Another impediment is the nature of a network solution. We estimate that a large proportion of the computer and Internet service providers' (ISP) infrastructure in the heartlands is relatively behind the cutting edge.

Even if people are willing to adapt, many will wait till enough players are using the network to make their use of it viable. This is similar to the problems faced by those marketing the first fax machines.

A large and steadily increasing number of farmers use the Internet to gather information and make purchase decisions. According to the National Agriculture Statistics Service (NASS), in 1999, 77% of US farms with sales of \$250,000 or more have access to a computer, 72% own or lease a computer, and 52% have Internet access (see **Table 1**). The larger and generally more successful farmer is relatively more computer savvy than his/her smaller counterpart. However, it is difficult to determine if enough of them will change, even incrementally, from their traditional ways of doing business. A survey of high-income farmers commissioned by the Agribusiness Division of Intertec Publishing confirms this challenge. Of the 36% of respondents who said they currently use the Internet, 78% said they use it primarily for email.

Although the Internet will be an important tool for enabling integrated producers to improve their systems, it is the co-coordinated systems that will reap the greatest benefit. This is true simply because, in an integrated system, there is not the need for the same focus on decision-making and price discovery because decisions are made unilaterally. Integrators will be able to take advantage of improvements to industry information flow and exchanges being developed for inputs, feeder pigs, culls, meat prod-

ucts, and by-products. Business to business e-commerce will influence and improve their price discovery and decision-making same as for the smaller producer and processors working toward co-coordinated systems the benefits of e-commerce will be more noticeable. The smaller and middle-class producer will have access to more information than ever before, thereby allowing for more accuracy in decision-making. Producers and processors will be able to benchmark production and price discovery online, creating a greater sense of community and their position in it. This is critical to future industry growth and stability.

Internet based value-add services

Online exchanges are being built in the agri-food/agribusiness space and will provide the platforms for rapid business-to-business e-commerce growth.

Price discovery has long been a weak spot in the agricultural economy and the producer has likely suffered most. These exchanges will trade outputs such as feeder pigs, cull animals, market hogs, and meat as well as inputs such as animal health products, crop inputs, labour, equipment, etc. In short, anything the producer and processor needs to sell or purchase will soon be available via the Internet.

To create a proper online market/exchange for the swine industry we believe that a full range of services must be offered including:

- risk management tools such as the ability to trade futures.
- data management
- content development
- an exchange platform
- decision-making tools
- logistics support

Table 1: US Farm Computer Usage, 1997 vs. July 1999 (source: US Department of Agriculture)

	With Computer Access		That Own Or Lease Computers		Computers For Farm Business		With Internet Access	
	1997	1999	1997	1999	1997	1999	1997	1999
<i>Farm Revenue</i>								
\$1,000-9,999	32%	42%	25%	34%	11%	14%	12%	25%
\$10,000-99,999	36%	46%	29%	38%	20%	26%	12%	27%
\$100,000+	60%	68%	54%	62%	47%	53%	20%	43%
<i>Farm Type</i>								
Crop Farms	41%	47%	34%	40%	24%	25%	14%	29%
Livestock Farms	36%	47%	28%	39%	17%	23%	12%	28%
All Farms	38%	47%	31%	40%	20%	24%	13%	29%

- trade facilitation
- clearing functions
- financial services
- web service
- marketing and advertising
- market making
- information services
- benchmarking
- e-tailing

These areas are exactly what farms.com is focused on for its producers-/processor-oriented swine industry site. Once developed, many of these features will be re-purposed for other livestock (cattle) and feedstuffs because of obvious synergies that can be created (e.g., the same farmers using our tools for hog production commonly also produce corn or cattle). Inefficiencies create opportunities and the pork chain has to improve in several crucial areas. Most of the effort in the industry has been directed toward increasing production, an area in which the industry has made great strides. It will still be critical to maximize asset utilization for both producers and packers alike. Industry rationalization will continue, particularly with respect to feed manufacturing, buildings and equipment, genetics, animal health, and animal slaughter facilities, distribution, and retailing.

Let's look specifically at e-commerce applications being developed and marketed today and the way they will positively affect the future of agribusiness. Livestock and crops will both see rapid growth in business-to-business e-commerce. Traditionally corn, beans, and hogs have been linked in the swine industry marketplace. To narrow our focus let's examine the following:

- markets/exchanges
- risk management
- decision-making tools
- e-stores/e-tailing
- financing

Markets/exchanges

E-Commerce online exchanges will develop around producer-to-producer products, producer-to-processor products, and processor output products. These exchanges will therefore be both producer-centered and processor-centered. Online marketplaces will be national, regional, and international but will be contained by logistics, safety, and other restrictions that influence the flow of physical products. You can **virtually** price an agricultural product but you can't **virtually** move it.

Producers can already buy and sell feeder pigs and early-weaned pigs—as well as cull boars, sows, and butcher hogs—online. As already discussed, price discovery has long been a weak spot for the producer. Intermediaries and brokers have moved between producer/processor, and processor/consumer confident in the truth that they alone know a product's true value and that no one talks to one another. Real time bid/ask online exchanges will create true price discovery because, in fact, a product is really worth what someone is willing to pay for it. Not knowing what a product is worth today is inexcusable. Many years ago my grandfather—a life-long cattle broker—lamented that the world's changed: farmers had radios. He was partly right but what good is a radio or, today, a computer if you don't turn it on. Real-time online price discovery will certainly improve the industry for both producer and processor but this is only part of what e-commerce will become.

Price discovery—yesterday and today

In the "good old days" farmers regularly went down to local auctions. At these open auctions farmers sold and bid for prize animals, calves, young hogs, etc. These auctions were an important forum for interaction and information sharing; they gave producers a chance to find out the range of prices they could expect to get for products—in other words, "price discovery."

Local auctions still take place today, but today's producers (whether small farmers or integrated producers) are really competing on a national, regional, or even international scale. Larger producers dedicate human resources in an effort to monitor current and future price environments. Where can the medium and smaller producers go for broader price discovery? Today, anybody but the largest producers is way down the price discovery and information food chain.

E-exchange bid/ask interactions will replicate the old market auctions on a much larger scale and are going to give the smaller producer a chance to level the playing field to a greater degree than had been possible heretofore.

Risk management services

Risk management will be offered online and tied to e-commerce exchanges. Future price discovery will be critical to both producer and processor. E-Futures and options will develop much as ETRADE(r) and AMERITRADE(r) have emerged to change Wall Street. A great improvement would be the creation of forward contracts capable of pricing feeder pigs and cull sows. Producer to producer feeder pig contracts will be offered online to operate in conjunction with real-time bid/ask exchanges. We need only add the technology since we have a century of Chicago Mercantile Exchange history to refer to. This will be of great benefit not only to weekly producers marketing feeder pigs and early weans but also to the large inte-

grators looking to manage supply overruns and shortages. Smithfield Foods, for example, could contract with a producer to sell Smithfield feeders and offer a finished hog contract at the same time. This allows integration and coordination to function in the same market space. Another great example would be for a cull processor to contract cull sows for a future time period thereby allowing him to confidently supply a retailer with branded sausage meat assured of the cost of his raw materials. Risk management improvements online will enable the producer and processor to make better decisions in managing their businesses.

Risk management CME/CBOT style

You may argue that exchanges such as the venerable Chicago Mercantile Exchange are already provided risk management (RM) tools. But are they really? Consider:

- Large-scale producers with dedicated RM staff can hedge their price risk using CME tools. Smaller producer, because of their lack of technical skill and the volumes they produce, don't really have the same opportunities.
- Most tools cover "finished" products and are more useful for processors trying to hedge their positions. In the hog vertical, it would be impractical for a packer wanting to enter a contract with a farmer to expect to use a CME future. Packer Formula Pricing (PFP) exists has two big flaws: (1) PFPs are not standardized—the formula used differs from packer to packer; and (2) they are subject to default.
- The CME traded about 2.3 million Lean Hog Futures products last year which we can easily compute to represent about 500 million hogs (40,000lbs per contract and using rule of thumb 185lbs per hog dead weight) *all* the hogs slaughtered last year in the U.S. and Canada give a grand total of about *120 million*. How did traders deal 500 million hogs? They didn't. The trade on the CME (which we respect very much) is largely paper trade and is becoming increasingly so. The factors that affect prices on the CME are significantly different from the factors that affect physical trade cost of production, supply, and demand.

Decision-making tools

Decision-making tools will be a critical piece of the ag e-commerce service package. Price discovery and risk management are critical to sustaining a profitable business but relevant data has to be analyzed and filtered from the relevant information available. After all data and information is rendered useless unless it can lead to an informed and correct decision. The swine industry incorrectly interpreted data and information available in the mid-1990s, which directly lead to producers producing more pigs than

we could reasonably slaughter in the fourth quarter of 1998.

E-Commerce and Internet developers must be wary of some simple truths. Information is "that which reduces uncertainty." The information age, in which we live according to Jack Trout in his marketing masterpiece "The New Positioning," is really "an explosion of non-information. It is an explosion of data"¹. What we've seen so far from the Internet is a mass of unfiltered, unedited, and—in some cases—even useless data. Trout goes on to make a very important statement. "What's the difference between data and information? Information must lead to understanding. Therefore, what constitutes information to one person may be mere data to another. If it doesn't make sense to you, it's not information."² If indeed this is true, and we must recognize that it is, then e-business must create the tools to manage and interpret relevant data correctly. The industry currently collects production data and there are numerous record keeping systems available. However, data is like baseball statistics—interesting but useless to all but a few managers who know how to use it to make educated decisions. E-Business must create an interface with each customer in order to interpret relevant data and information necessary to make correct decisions. The age of the infomediary and industry analyst is here. This may become the most important e-commerce opportunity available to the industry. Information may be free but you get what you pay for. The industry and its members can no longer afford to let the U.S.D.A do its record keeping and reporting. The U.S.D.A. does a valiant job but it's not nearly good enough for us all to go forward.

Example

There are lots of decision-making tools being disseminated on the Internet. These tools provide producers with the capability to input their business specific data such as animal specs, packers grid table, etc., and then test variables to help them make decisions. For example, if a producer increases lean yield by 1% *then* packer X will pay a \$Y premium.

E-Stores or e-tailing

The development of e-stores or e-tailing is currently in full swing. We can buy just about anything on the net and if the industry uses something it will be offered online. These online retailers will change normal distribution and retail channels and allow the business consumer definite advantages with respect to price and options. Long term this will drive waste out of the system and improve input costs. It is important to remember however that we will need to demonstrate improved logistics and asset utilization in order to improve the existing system for product distribution.

Online financing

Online financing will also be available in the future. Producers will be able to finance any product, up to and including the farm itself, online. Again, lenders will be made much more comfortable with their agri-business clients knowing that they manage risk, make informed decisions, have proper records (including production costs), and have access to competitive pricing on inputs and outputs.

There are, of course, a myriad of other services that will be available such as careers, logistics, consulting services, etc., and all will be developed according to the future needs of agri-business. The success and influence of e-commerce will be measured against its ability to drive waste and inefficiencies out of the system and at the same time add value. We must also continue to meet the needs of the consumer as demand for a safer, higher quality product increases at home and abroad. The Internet is only a tool to be used by the industry to improve itself.

More transparent value chains

Packers routinely make long-term contract with retailers. Creating standardized contracts *sitting on easily accessible e-exchanges* will allow for the management of supply-side risk with hog producers. Taking this one more step *backwards*, once RM tools for feed are made available to all producers via e-exchanges, the average producer will have the tools to better predict their future input costs.

The development of physical trade-oriented RM tools that are cheaply available to a broad audience via e-commerce platforms will allow all sizes of players in the agric-vertical to hedge their exposures to the cash market; this will only bring the industry up-to-date with other industries such as the auto industry where there is cost transparency along whole supply chains.

Conclusion

The Internet and the e-commerce channel are tools. The Internet provides us with a tool with which to easily bring together a widely dispersed audience. Despite the presence of large players, the agri-industry remains a highly fragmented sector. Sitting on top of the Internet, the e-commerce infrastructure—comprised of e-exchanges, chat rooms, etc.—can cheaply provide services to such wide-based audiences.

Between the end of 1998 and first half of 1999, a huge amount of equity flowed out of the hog industry. With hindsight, it's clear that production moved well ahead of demand and even slaughter capacity. How can the average swine producer today avoid suffering a similar loss in the future? I suggest there is very little he or she can do other than avoiding the industry all together. E-Exchanges, risk management tools, and other e-commerce-based services suddenly bring a whole range of opportunities to **all** players in the industry. Will food industry value chain be revolutionized by e-commerce? I think certainly YES. It's not a matter of if, but a question of how quickly.

Notes

- 1 Jack Trout, "The New Positioning", McGraw-Hill 1996
- 2 Jack Trout, "The New Positioning", McGraw-Hill 1996

