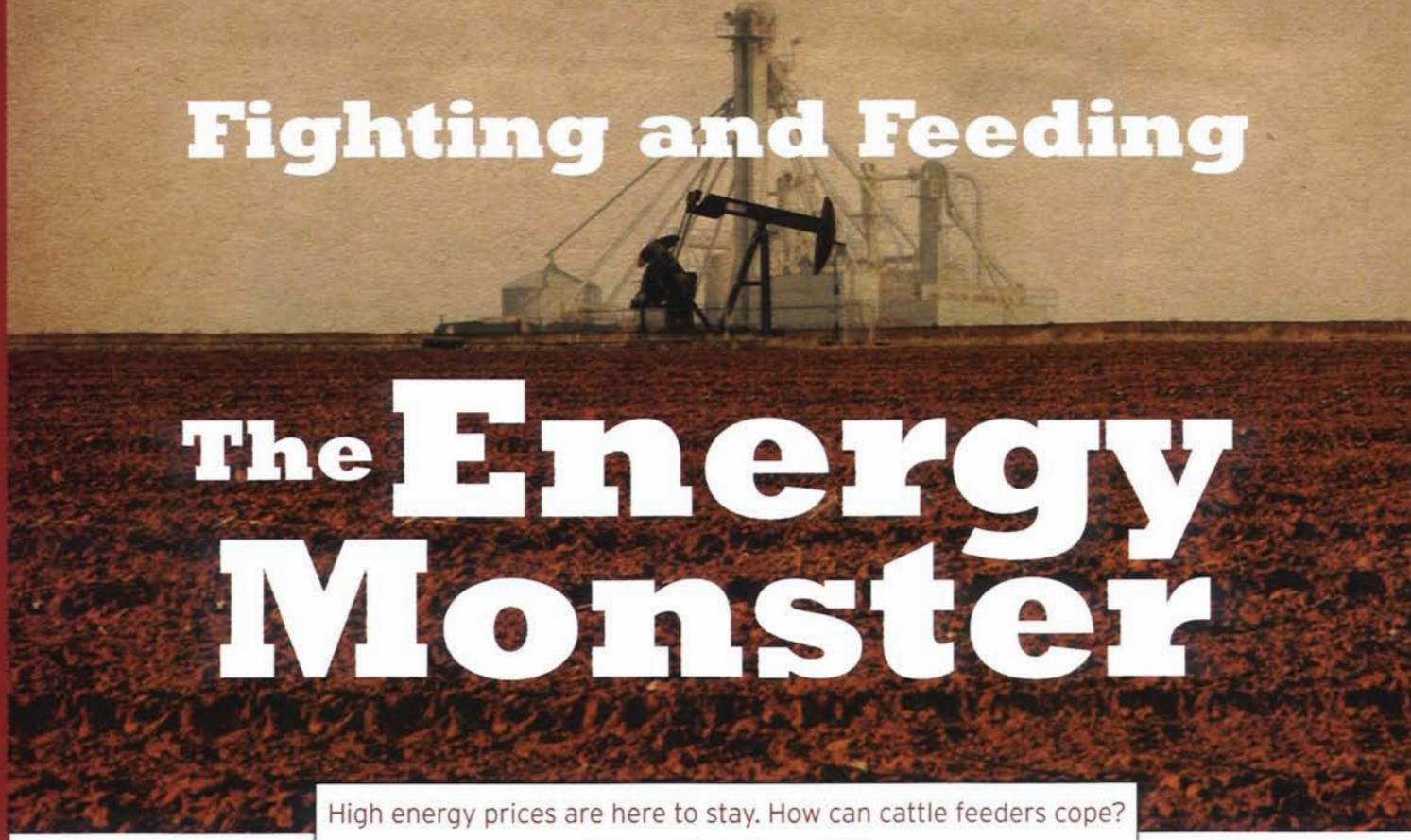

Fighting and Feeding The Energy Monster

High energy prices are here to stay. How can cattle feeders cope?

BY LARRY STALCUP

It is a problem faced by every business or consumer in the nation—high priced energy. Gasoline's too high! Diesel's too high! Electricity's too high! Don't even mention natural gas.

Feedyards deal with all of these inflated commodities. But the latter, natural gas, probably creates the most steam when the bill arrives from the utility that delivers this essential form of energy.

With feedyard natural gas bills that boil over at five figures behind the dollar sign, the cost of operating a feedyard in Cattle Feeding Country is the highest ever. Even with a huge national supply of natural gas available, energy experts say the days of natural gas prices at sub-$5 per mcf (a price cursed over and over not too long ago) are likely history.

High energy prices are also impacting the availability of locally-grown feed grains. With higher costs for running natural gas and electrical irrigation pumps, many growers in Cattle Feeding Country have switched from corn to cotton. That is creating even more demand for Midwest-grown corn to be shipped to Texas, Oklahoma and New Mexico feedyards.

However, feedyards in Cattle Feeding Country are not unaccustomed to challenges. They have used their ingenuity and innovative entrepreneur skills to come up with answers to solve those hurdles. Answers today may involve fine-tuning feed mill equipment or pooling with other feedyards to hedge natural gas prices. There is also talk of using a feedyard's most plentiful resource – manure – as a fuel to run boilers to steam flake grain.

Some of these measures may pay off and some may not. But many are being explored by scientists at the Texas A&M University Research and Extension Center in Amarillo, as well as other A&M locations, Texas Tech and other universities and private companies.

HAVE ENERGY PRICES TOPPED OUT?

That's the most common energy-related question in Cattle Feeding Country. "Probably not" is the answer. With continued trouble in the Middle East and greater global demand for fossil fuels from China and other countries, American businesses will continue to see higher prices, says Bill Thompson, vice president of marketing for Fowler Energy Co. in Austin.

"2005 was a tough year for energy prices," says Thompson, whose company works with clients to assist in energy purchases, transportation and other means. "The summer of 2005 saw natural gas pretty high (in the $7 to $9 mcf range). Then we were hit by Hurricane Katrina, and then Rita.

That, with other world situations, produced $14 to $15 gas."

Prices dropped below $9 early in 2006, "but there are a lot of indications that our lowest prices for 2006 will be in the first quarter. So with another hurricane season ahead, we could be back into double digit prices again."

Gauging the future of energy prices is about like predicting cattle prices. Volatility of prices may not necessarily be based on supply and demand. Fundamentals may be trumped by technicals. Sound familiar?

"Fundamentals governing natural gas have been very bearish. But those fundamental factors (of supply and demand) have taken a back seat to technical traders, who have found a way to move the market upward."

Greg Zuercher of Devlar Energy Marketing LLC in Centennial, Colo., adds that "if there is one thing we are learning it's that we are still going to be exposed to some price spikes."

The market is quite tight as far as supply and demand, he says. "Any time you are dealing with a tight market and overall demand that is increasing globally, you are still going to have periods of higher prices." Zuercher says situations like those brewing in the Middle East can create price increases overnight.

How about hedging natural gas to avoid such a spike? A typical TCFA feedyard may see its feed mill run up a bill for 1,000 to 4,000 mcf a month. Even though that's no small change, a single New York Mercantile Exchange natural gas contract is for 10,000 mcf.

"All users of natural gas have a hard time hedging because of not having enough volume," says Thompson, who works with feedyards and other customers to offset the limitations of the hefty contract size. "Sometimes we put smaller users together to pool and get a contract."

Bart Armstrong, manager of industrial marketing for Atmos Energy in Lubbock, says Atmos works with many feedyards to help them secure fuel at current prices for six months or longer. It doesn't always involve a straight NYMX hedge.

"The hedging end is part of the problem," he says. "NYMX is the only index to buy (natural gas) futures." Armstrong says Atmos can work with feedyards to lock in a distant price through measures similar to forward contracts for finished cattle. "We can go out six months, one year or even two years if they want," he says.

Zuercher says feedyards can also consider using NYMX options contracts to protect smaller amounts of natural gas. "We help find natural gas on the physical side and help bring the price down as well," he says. "It works similar to hedging cattle (with options)."

THE CHANGING FACE OF AGRICULTURE

Along with feedyards, farmers are also frowning over the high cost of energy. Those 200 to 250-bushel corn crops don't grow from 40-50 in. of rainfall in this region. Center pivots, surge flow and other furrow irrigation systems provide 20-30 in. of supplemental water to push those crops along.

Most irrigation engines are natural gas powered. And with the water table getting lower in many regions, it requires more energy to bring it to the surface. Even with the most efficient watering systems, those which obtain 95%-plus irrigation efficiency through LEPA drip and other low pressure models, the return for those huge corn crops doesn't cover production costs.

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Dr. Steve Amosson, Texas A&M University extension economist in Amarillo, says that with high energy prices today, he has never seen farmers caught in such a tight situation in which input costs are overwhelming.

In estimating 2006 crop production plans, he says gross returns for a 210-bu. corn crop at a price of $2.65/bu. (including government payments) will be about $556 per acre, including application of 21 in. of irrigation water. But variable costs are $590, producing a loss of about $34 per acre. Continued dry weather in the region could easily force growers to add the cost of 5 more inches of irrigation water to input costs.

Amosson's figures also show that cotton production doesn't pencil out much better. At a 52¢/lb. government loan price and an 850-lb. yield (just under 2 bales per acre), gross return is about $502 per acre. But only 12 in. of water is applied, holding variable costs to $526, for a loss of about $24.

However, farmers are still leaning toward cotton because of better transgenic seed varieties on the market, including Roundup Ready herbicide technology. These varieties, along with a solid boll weevil eradication program, are helping growers produce 3-bale or better cotton. The added bale means another $220 to $250 per acre.

Of course, fewer regional corn acres means feedyards must import more Corn Belt grain. At least 50% of the corn fed at TCFA area feedyards already comes from the Midwest. Unit trains arrive regularly with railroad cars of corn grown in Nebraska, Iowa or other states where irrigation is not as essential for corn production.

POOP POWER?

Ethanol is an emerging industry in Cattle Feeding Country—one that can be both a boon and a bane for cattle feeders. The bane is the increased corn demand of ethanol production and resulting higher corn prices. The boon is the byproduct, distillers grain, that fits well in feedyard rations.

And that's not all. One unique ethanol plant concept depends heavily on the cattle feeding industry, and not just as a customer for distillers grain. Panda Energy plans to fire its 100-million-gallon ethanol plant in Hereford with feedyard manure.

Rhett Hurless, Panda vice president of development, says the plant will convert about 1,500 tons of cattle manure a day into a clean burning biogas that will be used to power the plant's operation. He says that by using biogas instead of natural gas, the facility will save the equivalent of 1,000 barrels of oil per day, which will make it the most efficient refinery in the U.S.

As Panda president Todd Carter says, "We're taking the manure from one end, then feeding them the distillers grain at the other."

Hurless says the process used at the Hereford plant involves a "bubbling bed fluidized gasifier." It is a combustion process in which a blanket of sand in the bottom of the combustion unit is heated to about 1,500 degrees F. "Manure is blown into moving sand," says Hurless. "At 1,500 degrees, methane and other gases come off the manure and rise higher up in the combustion chamber. They are re-fired and moved into a heat exchanger."

When using manure for such a process, the amount of ash and moisture in the material must be considered. Dr. John Sweeten, resident director of the Texas A&M Research and Extension Center in Amarillo and one of the nation's foremost authorities of animal waste management, says the lower the ash content, the higher the BTU value of manure.

Sweeten says typical feedyard manure is 35% moisture and 40% ash. On a dry, ash-free basis, feedyard manure has a heating value of about 3,400 BTU per pound as received, which is about 40% the value for as-received coal.

He notes that there are 84 plants worldwide that use agricultural waste for energy. "Everything from olive skins, grape pits and chicken litter to pulp and paper waste are used," he says, adding that Panda has taken feedyard manure from the Texas Panhandle for testing in a facility in Idaho. "The testing is helping us determine the quality of the manure, as well as its impact on the environment.

"This is the right technology for manure," says Hurless.

FEEDYARD USE?

The theory of burning manure to create energy has been studied for more than 20 years by Texas A&M and Texas Tech University with funds partially provided by TCFA. Sweeten says there are several systems in use now to convert manure to methane that could theoretically work in providing energy to a feedyard to replace natural gas. But he is cautious about the economic feasibility of the process.

TCFA pioneered the use of infrared inspections for feedyards more than 15 years ago. That, along with the energy guidelines, has allowed feedyards in Cattle Feeding Country to stay well ahead of the escalating energy cost curve.

In the Panda program, which also includes planned facilities in southwest Kansas and eastern Colorado, special combustion units are being used to specifically use biomass, says Hurless. "We are looking to use feedlot manure, cotton gin waste and other materials where feasible."

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Energy Monster

The system being proposed by Panda could work in a feedyard setting, he says, but it would require an immense effort on the part of one or more feedyards to devote lots of money and manpower.

The technology is there for Panda to do it, says Sweeten. But it is a complex, 24-hour system, one that needs a specialized staff to make it run.

The combustion system that Panda will use is part of the "thermochemical approach" to converting animal or plant biomass to fuel, says Sweeten. There is also a slow process known as anaerobic digestion, a system similar to covered lagoons that heat a liquid slurry to create methane gas for energy.

Some large swine operations use the covered lagoon system for energy production as well as waste management. However, depending on the temperature, this system can require 30 to 60 days or more to create sufficient biogas to heat the digester efficiently. And if it is shut down, it can take long periods to bring the system back into production.

"As far as energy production is concerned, I believe feedyards need to do what they do best, be a fuel provider," says Sweeten. "I don't see it for on-site energy production."

Consequently, the best defense that feedyards have against high energy costs, for now at least, is a good offense—being as efficient as possible in their use of natural gas, electricity and other energy.

Fortunately, for feedyards and their customers alike, TCFA has had several programs in place for a number of years that help feedyards in Cattle Feeding Country manage their energy costs.

To start with, Sweeten encourages feedyard operators to review the TCFA energy management guidelines provided to Feedyard Members.

Then, feedyards should consider a thorough infrared thermography inspection of the feedmill to ensure that electricity is being used as efficiently as possible. TCFA pioneered the use of infrared inspections for feedyards more than 15 years ago. That, along with the energy guidelines, has allowed feedyards in Cattle Feeding Country to stay well ahead of the escalating energy cost curve.

To stay there, Tommy Smith, account manager for Xcel Energy in Amarillo, points out that, "It is sometimes difficult to justify replacing motors while they are still working. But with the fact that average energy costs are escalating, feedyards should consider replacing existing motors with high efficiency motors. I strongly recommend it if you see a chance for mechanical failure. Also, keep an eye out for obvious energy wasters, such as outdoor lighting that has a faulty photo cell and stays on 24 hours day."

In addition, Sweeten recommends reviewing the classic book, "The Feedlot," which contains a wealth of information on how to get the most out of equipment, both in the mill and throughout the feedyard.

In the end, there is no turning back the clock to times when cheap energy was not just expected, but considered almost a right for consumers and businesses. But with the necessity for innovation that high energy prices are providing, don't close the book on new technologies that could make manure and other energy-saving methods a reality in Cattle Feeding Country.

EDITOR'S NOTE—*Larry Stalcup writes on agriculture from his home base in Amarillo.*