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Dinner

New Mexico Beef Council

Lunch

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Sessions

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Breaks

Global Animal Management

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Roswell Livestock and Farm Supply

Texas Beef Council

2008 Southwest Beef Symposium

Roswell Convention & Civic Center
912 N. Main St., Roswell, NM 88201
January 16-17, 2008

January 16th, 2008

Managing Costs in the Face of High Feed and Fuel Prices

Session Sponsor – Texas Range Mineral
Moderator – Bruce Carpenter, Extension Livestock Specialist, Texas A&M University, Fort Stockton

1:00 pm **Welcome**
Clay Mathis, Extension Livestock Specialist, New Mexico State University, Las Cruces

1:10 pm **Feed and Fuel Price Outlook**
Derrell Peel, Extension Livestock Marketing Specialist, Oklahoma State University, Stillwater
Rob Hogan, Extension Economist, Texas A&M University, Fort Stockton

2:00 pm **Discovering Approaches to Cutting Costs**
Ron Gill, Extension Livestock Specialist, Texas A&M University, Stephenville

2:50 pm **Break and Trade Show –** *Break sponsored by New Mexico Cattle Growers Association*

3:20 pm **Strategic Ranch Management to Minimizing Cost**
Manny Encinias, Extension Livestock Specialist, New Mexico State University, Clayton

4:10 pm **Tactical Ranch Management to Minimizing Cost**
Ted McCollum, Extension Beef Specialist, Texas A&M University, Amarillo

6:00 pm **Steak Dinner at Roswell Convention and Civic Center**
Sponsored by New Mexico Beef Council

January 17th, 2008

Current Topics

Session Sponsor – ABS Global, Inc.
Moderator – Dina Reitzel, Executive Director, New Mexico Beef Council

8:30 am **Current Issues in Exporting U.S. Beef**
Derrell Peel, Extension Livestock Marketing Specialist, Oklahoma State University, Stillwater

9:00 am **Policy Issues Facing the Beef Industry**
Ross Wilson, President and CEO, Texas Cattle Feeders Association, Amarillo

9:50 am **Break and Trade Show –** *Break sponsored by Texas Beef Industry Council*

10:20 am **Food as a Social Platform**
Rick McCarty, Vice-President, Issues Management, National Cattlemen's Beef Association

11:10 am **National Market Cow and Bull Audit**
Dan Hale, Extension Meat Specialist, Texas A&M University, College Station

12:00 pm **Lunch –** *Sponsored by Pfizer Animal Health*

Managing for Improved Calf Health Beyond the Ranch

Session Sponsor – Pfizer Animal Health
Moderator – Manny Encinias, Extension Livestock Specialist, New Mexico State University, Clayton

1:00 pm **Feeder's Perspective on Calf Health**
Richard Winter, Manager of Feedyard Operations, Friona Industries, Amarillo

1:45 pm **Guidelines for Developing a Calf Vaccination Program**
John Wenzel, DVM, Extension Veterinarian, New Mexico State University, Las Cruces

2:30 pm **Break and Trade Show –** *Break sponsored by Roswell Livestock and Farm Supply*

3:00 pm **Calf Management: Weaning to Shipping**
Clay Mathis, Extension Livestock Specialist, New Mexico State University, Las Cruces

3:40 pm **Weaning and Backgrounding: Producers Perspective**
Don McCasland, Beef Producer, Clovis, NM

4:00 pm **Break and Trade Show –** *Break sponsored by Global Animal Management*

4:20 pm **I Followed the Guidelines and My Calves Got Sick Anyway: What happened?**
Glen Rogers, DVM, Pfizer Animal Health, Aledo, TX

5:00 pm **Adjourn**

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2008 Fuel Price Outlook

Rob Hogan
Assistant Professor and Extension Economist
Texas AgriLife Extension, Texas A&M System
Fort Stockton, TX

During 2007, news about fuel prices (if you are a rancher that is) has gone from bad to worse. The year started with crude oil price at $60.77 per bbl on Jan. 2, 2007. The crude oil price I am referring to is West Texas Intermediate crude oil price. **West Texas Intermediate** (**WTI**), also known as ***Texas Light Sweet***, is a type of crude oil used as a benchmark in oil pricing and it is the underlying commodity of New York Mercantile Exchange's oil futures contracts. At the time of this writing, the Dec. 18th price is pegged at $89.93 per bbl down from its Nov. 20th high of $99.16 per bbl.

As producers, everything we do and buy is effected by the price of crude oil; gasoline, diesel, the price of our stock feed, hay, prices of ethanol and biodiesel, the price of all steel products, electric wire, rubber products, computer parts and shop tools, electricity for our water wells, and groceries for our families—all are affected by the price of crude oil.

At this point, it appears global oil markets will remain tight through this forecasting period. It appears world demand will grow faster than global production. The Federal Energy Information Administration estimates that crude prices may remain in excess of $80.00 per bbl for the entire coming year of 2008. This $80**+** per barrel projected crude oil price is likely to result in historically high prices for major petroleum products. Gasoline and diesel fuel prices are estimated to average well over $3 per gallon in 2008, with gasoline prices peaking at over $3.40 per gallon during spring.

Drilling and Exploration

Given supply, demand, and product prices at these levels, a rational oil and gas producer would think about expanding their drilling programs by increasing field density so they could recover proven reserves more quickly (pump money out of the ground and into their bank accounts at a faster rate), right? They would also likely plan to do exploratory drilling to identify and expand their proven reserves.

Starting in 2005 and continuing through 2006, oil companies significantly increased spending. As Figure 1 shows, expenditures to find and develop oil and natural gas reserves in 2006 by the major U.S. oil and gas producers who report to EIA were more than 60 percent higher than in 2004 after adjusting for general price inflation. This big increase in spending has not yet resulted in significant reported increases in added reserves. In fact, reserve additions (measured in barrels of oil equivalent) for those companies in 2006 exceeded only two of the previous 17 years.

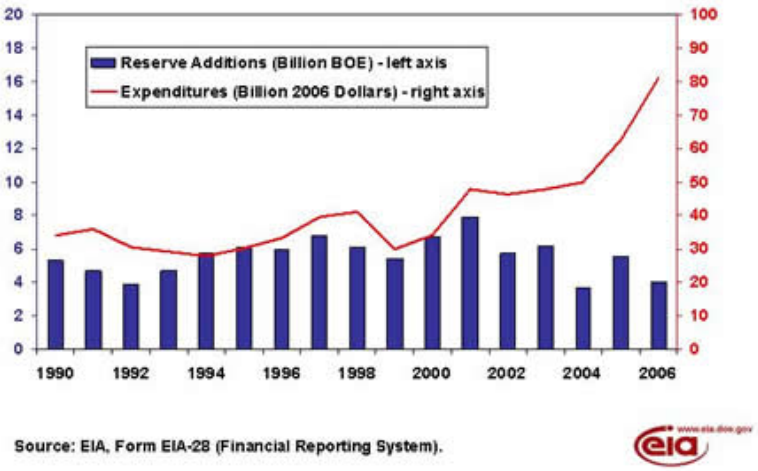

Figure 1. Exploration Expenditures Vs. Proven Reserve Additions.

Other Alternatives

The most obvious alternative that would produce almost instant additional crude oil in the supply chain is to simply open the oil wells up more and produce more oil. The first problem with that rationale is the OPEC producing countries have decided to let their production remain at the same level within the last few weeks of this writing. The second problem with simply upping production is shown in Figure 2. Large amounts of surplus production that could increase supply by opening valves simply do not exist. As can be seen beginning in 2002, surplus capacity fell to a low level in 2005. Only in 2006 could the trend have been reversed but it is much too soon to be certain of that.

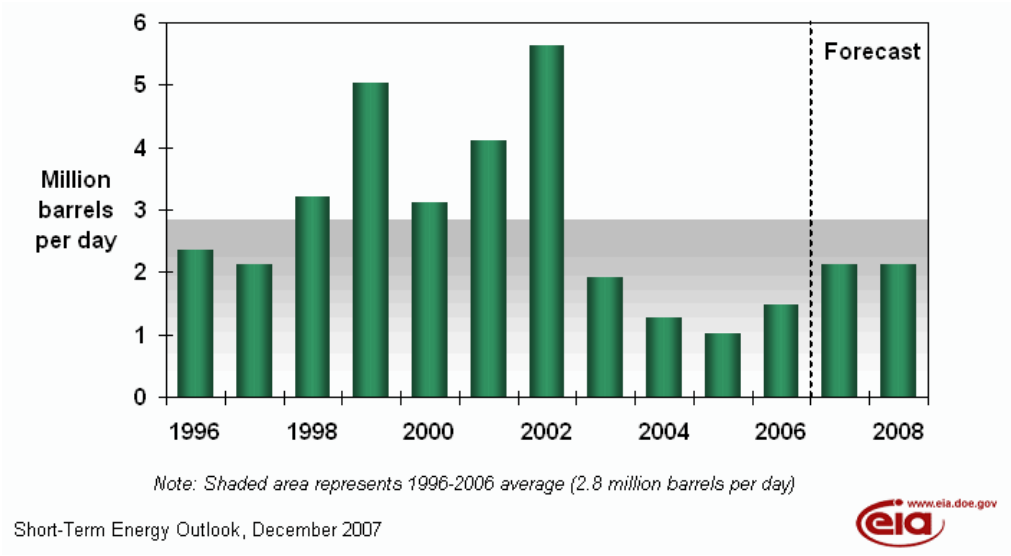

Figure 2. OPEC Surplus Crude Oil Production Capacity.

Then if we can't open the wells up and produce more perhaps we can use less; after all the U.S. is the largest consumer of the world's crude oil.

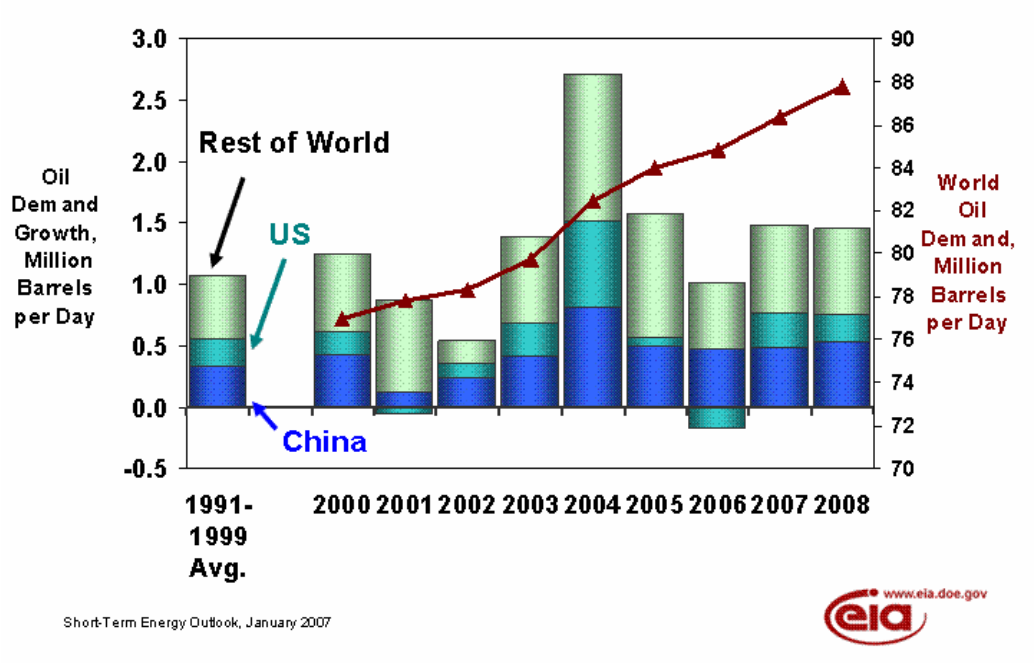

Figure 3. World Oil Demand Growth.

Figure 3 would seem to tell us the increasing demand for crude oil is not our problem (the U.S.) alone. While average demand domestically has remained fairly constant, growth in demand from China and the rest of the world has been increasing at a rapid rate. Thus while U.S. involvement may have originally started the problem our domestic consumption is not exacerbating the problem. However, the U.S. in the aggregate sense has to pay a high penalty in terms of balance of trade and cost of production inputs in agriculture.

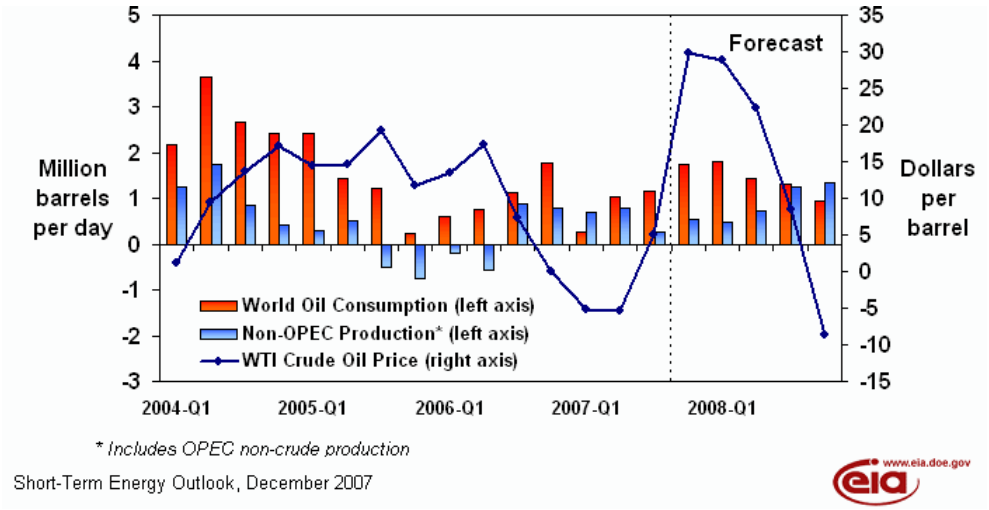

Figure 4. Change in World Consumption and Non-OPEC Production.

In Figure 4, it can be seen world consumption of crude had peaked during the second quarter of 2004 and consumption was trending downward when the Gulf Coast was hit by Hurricane Katrina in August of 2005. At that time a significant portion of the non-OPEC

supply went off-line due to storm damage. Crude prices started increasing then and have been spiraling up every since, even though non-OPEC production should have come back to about the level before Katrina.

Natural Gas

On November 30, 2007, working natural gas in storage was 3.44 trillion cubic feet (tcf). This is a high level of storage going into the heart of winter, which combined with limited remaining fuel switching capability (changing from one fuel to another), has somewhat isolated the natural gas market from the impact of recent price increases in petroleum markets to some extent. Consequently, while petroleum product prices are expected to increase and remain historically high, only moderate gains are expected for natural gas prices through 2008.

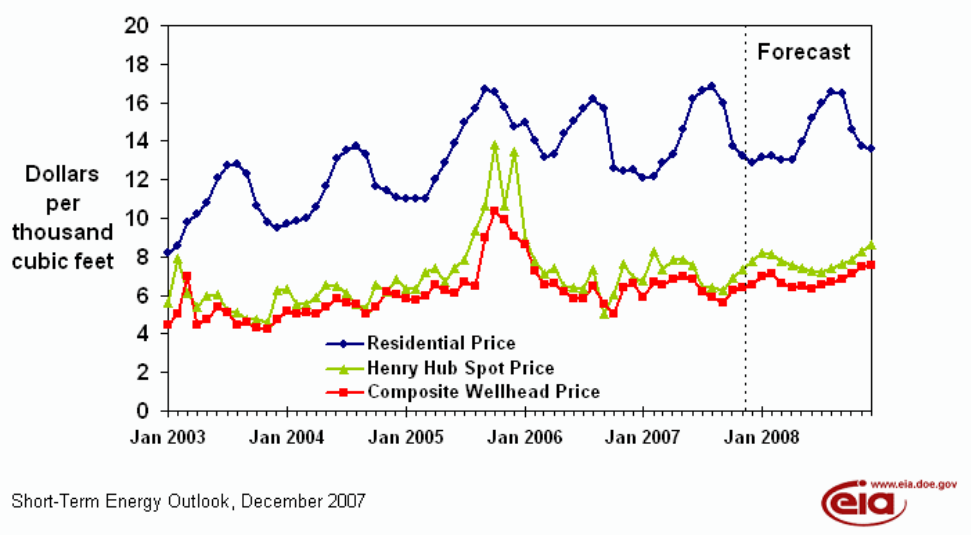

Figure 5. Natural Gas Prices.

The Henry Hub natural gas spot price (Figure 5) is expected to average about $7.21 per thousand cubic feet (mcf) in 2007 and $7.78 per mcf in 2008. Natural gas futures on the New York Mercantile Exchange are based on Henry Hub prices and could be considered wholesale natural gas prices. Average household natural gas expenditures (retail prices) this winter are expected to show an increase of about 7 percent compared with last winter.

Conclusion

In conclusion, it is projected in 2008 crude will increase 24% over ’07 (Table 1). Gasoline is projected to increase 7-24% over ’07. Diesel is estimated to be 12% higher in ’08, while natural gas is expected to cost some 8% more in ’08 than ’ 07.

Table 1. Energy Price Summary and Projection.

	Year		
	2007	2008	Difference 07-08
WTI Crude $/bbl	$64.42	> $80.00	+24%
Gasoline $/gal (Retail)	$2.80	$3.00 - $3.40	+7%-21%
Diesel $/gal (Retail)	$2.85	$3.20	+12%
Natural Gas $/mcf (Henry Hub)	$7.21	$7.78	+8%

2008 Feed Market Situation and Outlook[1]

Derrell S. Peel
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Stillwater

Prices for all major U.S. grain and oilseeds will average 50 to 90 percent higher in the 2007/2008 crop year compared to just two years ago. This means that prices for energy and protein feeds, as well as forage crops, will generally be higher than producers have been accustomed to in recent years. Moreover, relative changes in some feed markets means that price relationships between alternative feeds may have changed from historical patterns. Additionally, differing regional impacts have also changed price relationships regionally with significant short run and potential long run regional impacts.

Higher cost for feeds mean that cattle producers must be alert to dynamic feed market conditions and continually evaluate feeding and production alternatives. While all feed prices are expected to be higher, there will be relative feed bargains for producers in various regions and at various times. The beef cattle industry as a whole responds to higher feed costs by modifying production systems to take advantage of the feeding flexibility that goes with ruminant animal production. This suggests that the industry will see changes in market incentives that will generally favor forage-based production and reduced use of concentrate feeds. The industry must evaluate and consider the best use of a wide variety of feed and by-product feed alternatives that will be increasingly available. These changes have implications for cow-calf, stocker and feedlots sectors simultaneously.

U.S. agriculture is operating under a new set of rules. Driven primarily by biofuel demand, competition for agricultural resources is profoundly impacting all agricultural markets, either directly or indirectly. Although it is not yet clear what the permanent impacts will be, agricultural markets will, at a minimum, be in transition for several years.

Corn Markets are the Key

2008 will be a continuation of a massive series of impacts that will reverberate through agricultural markets for several years. 2007 was just the beginning! The sharp rise in corn prices in late 2006 prompted a 20 percent jump in corn plantings in 2007. That acreage increase, combined with good yields, resulted in a record corn crop of about 13.1 billion bushels. Ethanol demand for corn in 2007/2008 crop year at 3.2 billion bushels is roughly 50 percent higher than the previous crop year and almost twice the amount of corn used for ethanol just two years ago. This rapidly growing corn demand for industrial use, combined with slight increases in corn used for feed and exports, results in a projected total corn use for the 2007/2008 crop year of 12.69 billion bushels. Because of excellent production in 2007, corn inventories at the end of the crop year (August 31, 2008) are projected at 1.8 billion bushels. For many years, this level of ending stocks would be sufficient to allow corn prices

[1] Prepared for the Southwest Beef Conference, Roswell, New Mexico, January 16-17, 2008.

to drop significantly but that is not the case this year. Currently, corn is around $4.50/bu. in the Texas Panhandle and corn futures for the rest of the crop year suggest that Texas Panhandle corn prices will be between $4.50 and 5.00/bu. until harvest.

There seems to be no relief in sight. New-crop corn futures starting in September are currently priced about $4.80/bu. suggesting Texas Panhandle corn prices around $5.00/bu. into 2009 The demand driving these price levels appears likely to increase rather than decrease in the coming years. Current ethanol production capacity is about 7.4 billion gallons per year using about 2.64 billion bushels of corn annually. However, if all of the new plants currently under construction are completed in the next 18-24 months, ethanol capacity will expand to roughly 13.4 billion gallons and would use about 4.7 billion bushels of corn per year. A market for this increased ethanol production is ensured by the recently passed Energy Bill that raises renewable fuel standards to 9 billion gallons in 2009 and 15 billion gallons of corn-based ethanol by 2015. The corn market takes no comfort in the 2008 projected ending stocks of 1.8 billion bushels because the current price levels only hold if the U.S. is able to produce a string of 13 billion bushel or higher corn crops in the coming years. In order to do that the corn market must maintain planted acres and have growing conditions that produce record or near-record yields. There are a variety of market and production factors that suggest this will not be an easy feat.

Other Crop Markets will Challenge Corn in 2008

Both current and new-crop corn prices only partly reflect underlying demand and supply conditions; the current ending stock levels suggest that there are adequate corn supplies at this time. The real question is how much corn will be planted and harvested in 2008? Much of the 15 million acre increase in corn acreage in 2007 was facilitated by a nearly 12 million acre decrease in soybeans. Such a decrease in soybean production was possible with minimal market impacts because the current crop year started with record 2006 soybean ending stocks, the result of three large soybean crops in 2004-2006.

2008 soybean ending stocks are projected to be only one-third of 2007 levels. Thus, it is imperative for more acres to return to soybeans in 2008. The market is attempting to ensure that with new-crop soybean futures prices currently trading nearly $12.00/bu. In other words, corn, soybeans and other crops are in a bidding war for U.S. cropland in 2008. Additionally, there are several production reasons that suggest corn will not be able to maintain 2007 planted acreage. Many of the increased corn acres in 2007 were acres that followed corn in 2006 rather than the more typical 1:1 corn to soybean crop rotation. Planting corn for a third year on those acres will increase fertilizer needs without the nitrogen boost from soybeans and increase the odds for disease and pest problems that will eventually impact continuous corn production.

Energy versus Protein Feeds

Ethanol production removes the starch from corn and the resulting co-products have considerable feed value, especially for ruminants. The net effect of ethanol production is to reduce the initial volume by two-thirds and return a product that is approximately three times

more concentrated with protein. Pound for pound (dry basis), distillers grain has nearly as much energy (from the oil and fiber) as corn and all the protein of the original volume of corn in one-third of the pounds. The result is less total pounds of feed and relatively more protein compared to energy. This does not mean that protein is cheap but it does mean that corn is being driven by the energy value and the result is a relative increase in protein supplies. Biodiesel has a similar impact. Although still a tiny component of the market, the tendency for soybean and other oilseed markets to be driven by the oil component means that the protein meal is increasingly a residual in a relative sense.

Food Grains and Feed Grains

Early in 2007 it appeared that corn prices would likely set a floor for wheat price in the U.S., which happens occasionally when food grain prices drop to feed grain price levels. This year was unusual, however, in that it was the sharp rise in feed grain prices up to food grain price levels that appeared to lead to the potential for wheat to be priced and used to a greater degree as a feed grain. However, the poor U.S. wheat crop, combined with strong global demand and tight world stocks, caused wheat prices to rise to record levels for reasons largely unrelated to ethanol production.

Record average wheat prices are expected in 2008 and there appears to be little chance that food grain prices will drop to feed grain price levels in the coming year. Nevertheless, record high wheat prices further enhance, at least indirectly, the bidding war for crop acreage in 2008. Although wheat and corn are grown in different regions and do not, for the most part, compete directly for cropland, they do compete indirectly in the Great Plains where wheat and grain sorghum are alternatives and in the Delta and parts of the Southeast where spring wheat and soybeans compete. Finally, it should be noted that the current high wheat price is largely a function of supply conditions and will likely decrease with better crops in the U.S. and in other major wheat production countries. In a year or two, we could easily see food grain prices drop again and be influenced directly by the sharply higher feed grain prices which are not likely to go away for the foreseeable future.

Grain versus Forage

Forage values are generally higher in the U.S. for a variety of reasons related to both demand and supply. Regional droughts have affected forage and cattle production significantly since 2002. The extreme drought conditions in the Southern Plains in 2005 and 2006 resulted in the U.S. having record low hay supplies on May 1, 2006. The extreme drought in 2007 in the Southeast will further reduce hay supplies going into 2008. Many regions of the West and Rocky Mountain region are also very dry with poor range conditions. In 2007, the ratio of corn harvested to planted acres was higher than usual, in large part because fewer corn acres were harvested as silage, a situation likely to be repeated in 2008. There is little doubt that some annual pasture and hay acres will be used for other crop production in 2008 and beyond. All of these things indicate that forage supplies will be relatively tight in the coming year.

High grain prices are an incentive for the cattle industry to use less grain and more forage to the extent possible. The primary means for the beef cattle industry to use less grain is to place cattle into feedlots at bigger weights, which means that feeder cattle must be grown longer as stocker cattle and thus represents an increased demand for forage. These same conditions may also be an incentive for cow-calf producers to retain calves to bigger weights through the stocker phase.

Implications

Cattle producers must be aware of changing market conditions for both feed and cattle and be prepared to consider a wider range of production alternatives. It is not business as usual for the foreseeable future and while there are significant challenges and potential threats, there are also new opportunities in the current situation. It is imperative to remain vigilant and to be prepared to adjust to a very dynamic feed market environment.

Strategic Ranch Management to Minimize Cost

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Managers of cow-calf operations throughout the U.S. are plagued with defining strategies to improve profitability margins amidst rising energy and feed costs. Speculatively, analysts indicate the cost of production across all sectors of the beef industry will continue to increase in the near future at a rate as unpredictable as the crude oil and corn markets. As a result, managers will be challenged by their ability to critically evaluate their ranching operation and current management practices, and adopt strategies to ensure long-term sustainability of the ranch.

Commencing calving during warmer temperatures and closer to green-up of native grasses is a strategic management recommendation that has received considerable press in recent years. This paper is intended to provide guidance to producer's considering such a change to his/her cow-calf operation.

Evaluating Your Situation

The decision to make significant changes to a cow-calf operation should only be considered after ranch-specific range, production, and financial data demonstrates change is necessary and may provide opportunity to reduce supplementation and fuel costs. While textbooks and popular press articles provide generalizations about the economics of ranching operations in the Southwest, it is in a manager's best interest to collect, analyze, and interpret ranch-specific data to provide the clearest and most descriptive fiscal illustration.

Cow-calf managers are encouraged to conduct an annual financial analysis of ranch operations. Programs such as the Standardized Performance Analysis (SPA), offered in many states through the Cooperative Extension Service, aid cow-calf producers in evaluating ranch finances and cattle performance relative to other ranching operations and benchmarks established within a state and/or region. By comparing the performance of a single operation to benchmarks, producers gain an enhanced ability to monetarily prioritize changes to management practices.

The cost of purchasing and delivery supplemental feed to cattle grazing native rangelands is commonly the single largest operating expense incurred on beef cattle operations in the Southwest. This is largely due to the fact that protein supplementation is required throughout a majority of the calendar year to meet nutrient requirements of traditional winter-calving cowherds grazing predominantly warm-season native rangelands in the Southwest. In addition, larger framed cows (greater mature body weights), coupled with higher milk-yielding genetics will incur higher supplementation costs than smaller framed, moderate milking females. Additionally, extended or a year-round calving season also creates challenges when attempting to meet the nutrient requirements of cows during peak lactation.

Implementing rangeland monitoring techniques to routinely and objectively quantify available forage (lbs./acre) across multiple pastures across the ranch, and also define forage quality (i.e. crude protein, energy, and trace mineral composition) is as good an exercise for a ranch crew managing cattle grazing native rangelands in the Southwest as is determining which cows produce the heaviest calves. Ranch-specific forage supply and quality data described for a calendar year across successive years with variable precipitation is an inexpensive investment to accurately understand forage use relative to mature cow body weight and implement effective strategies to minimize supplementation costs.

Exploring Calving Season Options

Historically, cow-calf producers have chosen to initiate calving during periods when optimal weather increases calf survivability and forage quality closely matches cow nutrient requirements. This theory has been supported in the scientific literature for three decades as a means to sustain productivity and reduce supplementation costs. Unfortunately, throughout many regions of the U.S. many cow-calf operations have opted to commence calving during periods when native rangelands are dormant and limited in nutrient concentration necessary to meet maintenance requirements during lactation in a presumed effort to increase weaning weights at traditional marketing periods. As producers have evaluated the economics of these types of systems many producers are considering reverting or changing calving seasons to reduce annual cow costs.

Moving a calving season forward (i.e. February to April) can be easily accomplished. However, managers should evaluate the pro's and con's of moving a calving season forward, because it will be extremely more difficult to move a calving season backward if the move forward does not elicit the desired performance and/or economic response. As would be expected, results vary across production environments.

As previously mentioned, winter-calving is common throughout the U.S. to increase fall weaning weights. Furthermore, seedstock operations commonly utilize winter-calving to ensure yearling bulls can achieve adequate body weight relative to age to pass breeding soundness exams and service females during spring and summer breeding. Using NRC Nutrient Requirements for Beef Cattle and published forage quality averages for common warm-season grass species found on native rangeland in south-central NM, winter-calving (December to February) cows will require the highest level of protein supplementation compared to spring, summer, or fall calving. Research conducted in production environments where substantial quantities of harvest forages are relied upon to winter cows have observed substantial advantages in moving calving season forward to minimize winter feed cost.

Transitioning from a winter- to a spring-calving (March to May) season is advantageous across most production environments. Weaning weights will be reduced relative to calendar dates, but may provide opportunities to continue to market at traditional marketing dates without sacrificing significant tonnage. Data suggests supplementation needs are lower compared to winter-calving on rangelands with predominantly warm-season grass species. The availability of a cool-season grasses, which green-up earlier in the spring than

warm-season grasses, on native rangelands or permanent pasture will more closely match maintenance requirements for lactation further reducing supplementation costs and increasing weaning weights.

Calving during summer months (June-August) most closely matches maintenance requirements for lactation and may provide the largest supplementation savings and reduction in annual cow costs. However, summer calving requires important marketing decisions, as calves will likely be considerably younger and lighter than spring born calves if marketed in the fall. Summer calves may be better suited to be marketed during the subsequent late winter or early spring when long-term average prices for calves rebound from fall lows. The greatest advantage of summer calving may be experienced by those producers who retain ownership of calves and can cost-effectively grow calves on sub-irrigated meadows, wheat or permanent pastures throughout the winter months and market calves the following spring.

Though summer calving can result in significant supplementation savings across most regions in the U.S., it is not suited for all production environments. Significant decreases in bull fertility and cow conception rates have been observed in summer-calving research carried out in regions of the U.S. where cattle experience a higher incidence of heat stress that is induced by limited night cooling and high humidity. Moreover, the negative impacts on reproduction have also been observed in regions with significant endophyte-infected fescue pastures. While the summer temperatures in the southwest often reach or exceed 100°F, significant night cooling and low humidity are common, and research in southern NM suggests reproductive performance is not negatively impacted in summer-calving scenarios.

Fall calving is not as common throughout the Southwest, but should be evaluated as an option. When calving commences in late-summer and early fall, producers can wean calves and benefit from historical high calf prices in the spring. However, research does suggest fall-born calves wean at lighter body weights compared to spring-born calves at the same age, most likely depressed due to reduced milk production in cows that are marginal in energy intake. Theoretically, a fall-calving scenario could be viewed as an expensive proposition. However, depending on the supplementation program, late-summer and fall-calving cows may actually be able to be roughed (receive limited supplementation) after the breeding season until weaning in the spring, and still have ample opportunity to regain body condition on green grass prior to calving.

Effects of Calving Season on the Economics of Traditional Supplementation Programs Commonly Used in the Southwest

Conclusions

The decision to make significant changes to a cow-calf operation should only be considered after ranch-specific range, production, and financial data demonstrates change is necessary and provides opportunity to reduce supplementation and fuel costs. Before

changing your calving season consider and develop a plan to market calves. Commercial cow-calf operations have the greatest flexibility and opportunity to benefit from moving calving dates forward to spring and possibly summer dates. Recognize moving a calving season by several months may change the timing of cash flow for ranch. Furthermore, while supplementation costs may be reduced by more closely matching cow requirements with nutritional quality of available native forage, it is important to evaluate the overall economic impacts of the proposed changes before implementing on cow-calf operations in the Southwest.

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Tactical Management to Reduce Costs

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Extension Beef Cattle Specialist
Texas AgriLife Extension – Texas A&M System
Amarillo

In a recent planning session, a cohort in Extension related that he had developed a presentation titled "It's a New World" (or something very close to this) addressing the escalation in feed costs, fuel costs, and fertilizer costs, among others, faced by cattle producers. Is this really a "new world" or has the industry simply enjoyed a few years where calf values outran production costs and now we are returning to a situation where margins are again narrow because of escalating production costs?

Figures 1 and 2 were developed by Stan Bevers (Bevers, 2007) using data collected from ranches in the Southwest Standardized Performance Analysis (SPA) Database (this includes New Mexico and Texas). Costs and values in these figures are averages derived from the database and may or may not represent an individual operation but serve as platform for discussion. Figure 1 illustrates the total cost to maintain a cow in the herd on ranches in the Southwest SPA database. All costs are accounted for including depreciation and family labor/living withdrawals. In Figure 2, the cow cost was transformed into cost per 100 lbs of calf weaned and compared to the value received for the calf.

The total cost of maintaining a cow has been increasing since the mid-1990's. So why does there now, in 2007-08, seem to be heightened concern about costs? They have been on a general climb for several years. Perhaps Figure 3 will shed some light. Because cow costs have been increasing so has the cost per 100 lbs of calf weaned. However, as we entered the 21st century calf prices increased rather significantly and have maintained a relatively high level since (this is changing). Also, based on the SPA Database, cost of producing the calf dropped in 2001 and leveled for a couple of years before resuming its upward trend. As such, the value of the calves surpassed the total cost of producing the calf for a few years. Perhaps this period of high prices and profits blurred our focus and subdued our concerns about costs.

So, is the title of my cohort's presentation "It's a New World" appropriate or should we draw upon the wisdom of Yogi Berra who once stated "This is like deja vu all over again". Today, we are returning to the same cost/value situation of pre-2001. Conditions in domestic and global markets for fuel, fertilizer, grains, and oilseeds have and continue to push input costs higher and are now pressuring calf prices downward.

Tactical Management or Operational Management

Tactical management involves implementing specific steps or actions to achieve strategic goals. Strategic goals and plans are typically longterm in nature (3-5 years or more), may be more general or abstract and require action plans (tactical/operational) to go with them. Tactical and operational planning and management are short term and implement the

steps necessary to achieve the strategic goal. What needs to be done this year, this month, this week, or today? Who is responsible? How will it be done? When will it be done?

Tactical or Operational Considerations to Reduce Costs

Table 1 was developed by Stan Bevers (Bevers, 2007) and includes a breakdown of the costs for 56 ranches that participated in the Southwest SPA Database from 2003-2006. In the table, regions 1 and 2 are Central and East Texas while region 5 is the Rolling Plains, South Plains, and High Plains of Texas. The table includes columns of actual costs with an accompanying column reflecting the proportion (%) of total cost for the cost item. Again, these are averages of several ranches and may not represent an individual situation; however, the data are a good baseline representation of "where" and "what" the costs are. This breakdown provides some ideas of where one might focus to develop tactical management to reduce costs.

On average, depreciation was the largest item representing about 15% of total cost. Depreciation includes breeding stock, machinery and equipment, and buildings and improvements. Purchased feed was the second largest cost and represented 13.6% of total cost. Hired Labor and Management – which includes salary, taxes, and benefits of those hired to work on the ranch (including day labor) - accounted for 11.1% of total cost. If family living withdrawals (4.9% of total) are included to reflect payment for owner and family labor, the total for Hired Labor and Management plus Family withdrawal represented 16% of total cost. These three – depreciation, feed, hired labor+family withdrawal – accounted for 40% of total cost. The other 60% of cost is in 18 items that account for less than 1 to a bit over 8% of total cost. Again, these are averages and your costs may be different, but most of these cost accounts are present on every ranch.

Based on this breakdown, where would one focus to reduce or optimize cost? Are there approaches to operational management that could reduce costs? It is probably impossible (and illogical) to completely eliminate most costs; but it may be possible to reduce several items to some degree and make a difference in total cost.

For instance, if a ranch goal is to maintain cow productivity, in the majority of situations in New Mexico and western Texas it will not be possible to completely eliminate purchased feed. However, there may be opportunities to change feed, purchasing, or feeding management and reduce price, total feed required, and fuel, equipment, and labor cost associated with feeding.

Approaches

Operational planning Operational plans typically outline how to achieve very specific and very short run (this year, month, week) goals and objectives. Operational plans are "tactical" meaning that they describe how specific goals will be achieved through day-to-day operations. Can operations on the ranch – from the annual spring work and fall shipping to the day-to-day routines, be planned to economize time, equipment use, fuel use, etc.? Periodic "staff" meetings to focus on plans and openly discuss problems and alternative

approaches to operations can be useful. Weekly and daily planning to prioritize and coordinate work task may reduce unnecessary travel, economize labor, etc.

Depreciation Depreciation costs represent the decline in the useful life of assets that have to be replaced. Tax laws and accounting methods allow different types of depreciation so the annual calculated costs of depreciation can vary widely. But do not lose sight of what depreciation is – the cost of replacing assets with a limited life. It may not be possible to alter a depreciation schedule and the costs on paper, but it is possible to extend the life of an asset through proper care, use and maintenance.

Feed purchasing and management Because of the current domestic and global situation with grain and oilseed stocks and use, coupled with the increase costs of transportation and feed manufacture, significant relief in feed prices does not appear likely in the next few years. As shown in table 1, purchased feeds are one of the big three cost items. Supplemental feeds are usually a necessity to properly manage cows and maintain productivity. Who knows there may be a day when the cost of feed outweighs the production benefit and we revert to less productive systems that were present 100 years ago in the southwest or currently present in countries of the world where costs outweigh benefits. However assuming we are still going to maintain optimum nutrition there may be tactical management that can chip a way at feed costs and other costs associated with the feeding program. A few might be:

1. Reevaluate stocking rates and adjust to forage conditions. Lightening up can potentially reduce feed requirements.
2. Study grazing management plans that group cows into larger numbers during the supplementation season. This approach can possibly reduce time, fuel, equipment use required to check and feed cattle.
3. Study grazing management plans that reserve grazing units nearer to headquarters or camps for winter use. This may reduce distance required to haul feed and check cattle. Deferring pastures for winter use may also alter the type and amount of supplement that is required.
4. Investigate seasonal prices of supplemental feedstuffs to determine if feed can be priced or purchased (and carried) at a time when price is typically discount to other times of the year.
5. Investigate frequency of supplementation feeding and options to decrease frequency; this can possibly reduce time, time, fuel, equipment use required to feed cattle.
6. Investigate different supplemental feed alternatives. Changing type of supplement can reduce tonnage needed which can reduce time, fuel, and equipment use. Some ranches may be able to purchase and utilize commodity feeds that are lower cost than other alternatives.
7. Group cows based on feed requirements for the winter. This approach may not reduce feed outlays but may increase the effectiveness of the feeding program.
8. If the operation uses significant amounts of hay or other purchased roughages, investigate why this is and determine if adjustments to reduce purchases can be accommodated.

Other costs Sixty percent cost in table 1 is tied up in 18 accounts that average about $17-18/cow/year. Making big changes in cow costs by attacking one of these individual accounts will not be possible but a dollar here and dollar there can add up.

Fuel is on everyone's mind. The fuel costs in table 1 are an average from the 2003-2006 period. Today, fuel is at least 50% higher than in those years. Fuel costs do not appear to be easing up anytime in the near future. Investigating means of reducing vehicle use is the only means of reducing or controlling this cost. Some of the ideas under feed management fit into the fuel discussion. Daily and weekly planning to reduce duplicative trips to complete tasks, and other considerations must be weighed.

Conclusion

Over the past few years, cow/calf producers have enjoyed a time when calf prices were relatively high compared to costs of production. However, we have returned to times when the margin between production costs and calf values has narrowed or disappeared. Many of the varied costs in cow/calf production are a necessity, so it seems illogical to expect to make great changes by focusing on one cost category. Instead, small reductions in several costs will be necessary. Tactical and operational planning can help ranchers identify means of controlling costs and implementing operational plans to achieve that objective.

Literature

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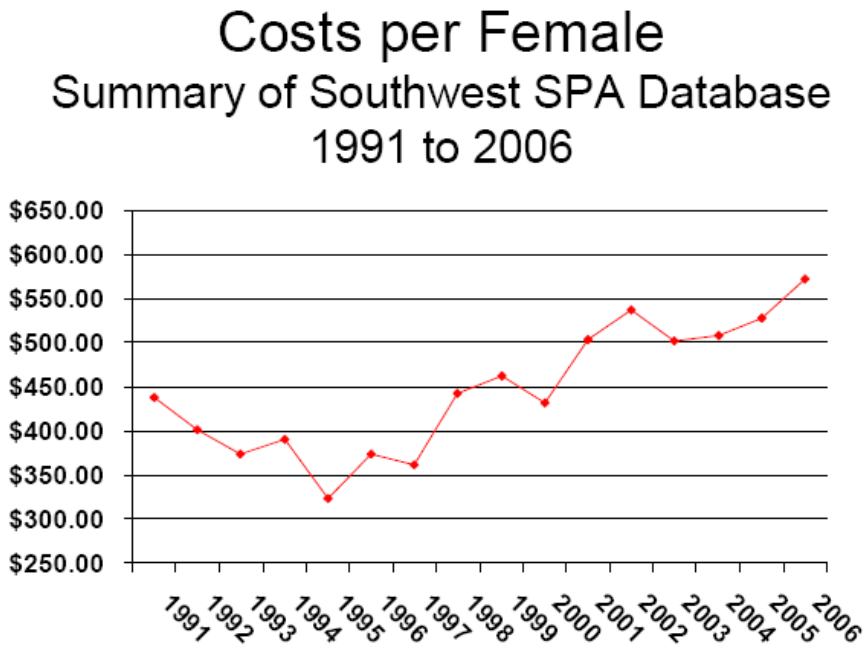

Figure 1. Total costs per breeding female derived from ranches in the Southwest SPA Database. (Bevers, 2007).

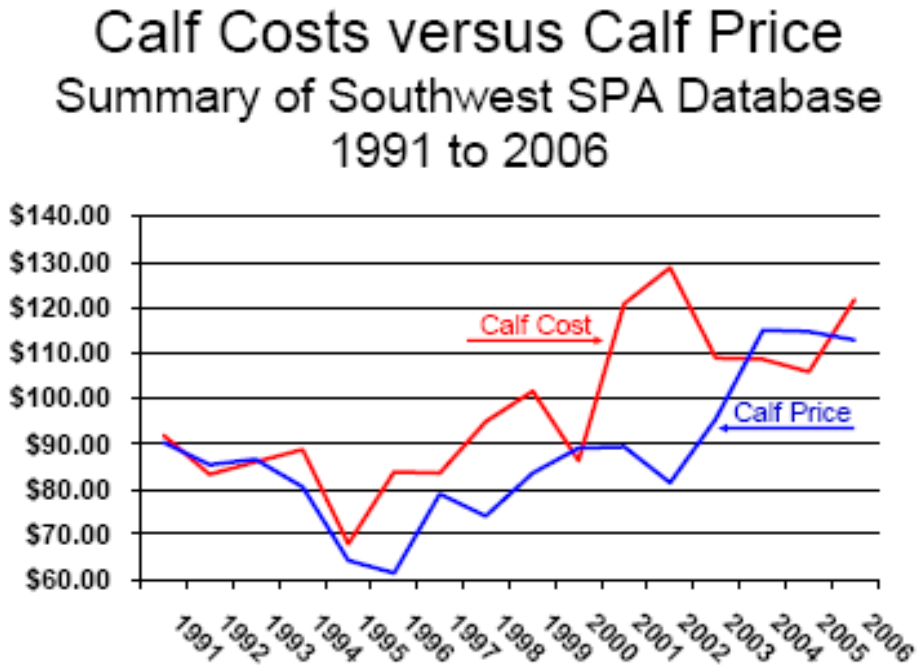

Figure 2. Total costs per breeding female derived from ranches in the Southwest SPA Database. (Bevers, 2007)

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Table 1. 2003 - 2006 Average Costs to Maintain a Breeding Female in Texas

	Texas Average		Region 1 & 2		Region 5	
	Mean	Percent	Mean	Percent	Mean	Percent
Operating Revenues						
1) Raised Livestock	398.46	77.7	413.96	84.8	385.85	70.8
2) Non-cash Values	80.59	15.7	63.22	13.0	101.99	18.7
3) Gains/Losses	23.91	4.7	1.97	0.4	46.14	8.5
4) Other Income	10.03	2.0	8.72	1.8	10.66	2.0
Gross Revenues	512.99	100.0	487.87	100.0	544.64	100.0
Operating Expenses						
1) Depreciation	79.83	15.1	68.09	12.4	89.92	17.5
2) Feed Purchase	71.57	13.6	72.25	13.1	72.50	14.1
3) Hired Labor & Management	58.78	11.1	85.27	15.5	35.20	6.8
4) Fertilizers	45.60	8.6	61.10	11.1	33.96	6.6
5) Rents & Leases	36.67	6.9	33.84	6.1	36.74	7.1
6) Repairs & Maintenance	35.24	6.7	34.38	6.2	38.41	7.5
7) Family Living Withdrawals	25.85	4.9	25.64	4.6	26.66	5.2
8) Gasoline, Fuel, Oil	24.85	4.7	30.25	5.5	20.73	4.0
9) Veterinary & Breeding	24.39	4.6	22.18	4.0	26.41	5.1
10) Interest	22.90	4.3	12.08	2.2	32.81	6.4
11) Supplies	19.27	3.6	19.56	3.5	20.13	3.9
12) Property Taxes	16.11	3.1	20.19	3.7	13.46	2.6
13) Custom Hire Work	15.66	3.0	19.68	3.6	13.04	2.5
14) Insurance	10.83	2.1	12.96	2.4	9.47	1.8
15) Miscellaneous	10.45	2.0	8.37	1.5	11.38	2.2
16) Utilities	10.39	2.0	10.53	1.9	10.96	2.1
17) Chemicals	7.18	1.4	5.45	1.0	9.00	1.7
18) Professional Fees	4.32	0.8	4.51	0.8	4.22	0.8
19) Seed & Plants	4.09	0.8	5.37	1.0	3.00	0.6
20) Net Accural Expenses	2.72	0.5	(0.50)	(0.1)	5.50	1.1
21) Freight & Trucking	1.23	0.2	0.36	0.1	1.62	0.3
Total Costs (Including Family)	527.94	100.0	551.57	100.0	515.13	100.0
Net Income	(14.95)		(63.69)		29.51	

(Bevers, 2007)

2008 World Beef and Cattle Trade

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World beef trade continues to grow while the U.S. struggles to regain export markets lost as a result of BSE in late 2003. Some aspects of the global trade situation are changing very rapidly and it is increasing apparent that a focus on regaining the pre-BSE status quo is irrelevant as we are unlikely to return to that environment. There are both threats and opportunities in the emerging global market environment, in general, and especially for the U.S. Arguably the greatest threat is failing to recognize the dynamic nature of the markets and the imperative to respond with agility. On the other hand, there is tremendous opportunity to learn from the mistakes and frustrations of the past five years and move forward with unprecedented global market potential.

U.S. Beef Exports

2007 beef exports are projected at just under 1.5 billion pounds, nearly 60 percent of the 2003 record export total. Since 2004, Mexico and Canada have provided the strong base for U.S. beef exports. Based on 2007 cumulative total through October, Mexico accounted for 41 percent of beef exports, with Canada adding another 23 percent. From this market base, the U.S. has worked to rebuild other traditionally important markets for U.S. beef. Progress in Japan and South Korea has been frustratingly slow. Assuming more progress in the Asian markets, U.S. beef exports are forecast to increase another 15 percent in 2008.

Beginning in mid-2006, the U.S. government reached an agreement with Japan that allowed restricted access to the Japanese market. However, the restrictions, principally the fact that only meat from animal under 21 months of age is permitted, have limited the available supply and increased the costs of supplying the Japanese market and quantities have trended up slowly since then. Through October of 2007, beef exports to Japan accounted for 11 percent of total beef exports for the year. The future potential for the U.S. in the Japanese market is somewhat uncertain. Japanese beef consumption has never fully recovered from the negative consumer reaction to the discovery of BSE in Japan in 2001. That fact, plus the firmly entrenched Australian presence in the Japanese market and the fact that U.S. beef prices are cyclically high all serve to temper the pace of progress in Japan.

The situation in South Korea is even more protracted and frustrating. After finally receiving access politically in 2007, repeated mistakes in Korean bound shipments and an extremely rigid import inspection process led to a number of shipments being delayed or rejected and ultimately to closure of the border once again. Despite this, the U.S. was able to ship over 77 million pounds of beef to South Korea, representing 6.5 percent of the January through October total. The process is once again a political one and the U.S. will take up

discussions in 2008 with some new officials following late December elections in South Korea.

Trade Lessons (Hopefully) Learned

The frustrations of regaining the Asian markets have revealed some lessons that the U.S. beef industry and government will hopefully learn from. The first lesson is the value of patience in trade politics. Beginning in 2004, there was tremendous pressure on the U.S. government to reopen markets and the implied message was that any deal is better than no deal. The restricted Japanese market that we now have and the reluctance of the Japanese to further open the market have proved to be a barrier longer term. It is hard for the Japanese, having tightly restricted the market, to backtrack on those restrictions in a manner that is acceptable to Japanese consumers and voters. In South Korea, the details of the agreement (e.g. no bones) led, in one case, to rejection of shipments where bone dust from meat fabrication was interpreted as a violation of the agreement. The interpretation doesn't seem reasonable but, the South Koreans were, in essence, beating us with a stick that we gave them. We learned the hard way that the details are very important.

In the case of the South Koreans, there is another lesson as well. Repeated incidents where the wrong product was shipped or the product was incorrectly labeled highlights the fact that it is increasingly important for the industry to get the details right. In the case of international trade, a mistake not only sours the deal at hand but may also have major implications for everyone if it leads to delays, increased inspections or border closure. The situation is made even worse when there are different agreements with various countries, which makes it even harder for industry participants to know the rules in each case. The beef industry is complex and there are a vast set of wholesale products that get shipped. Mistakes happen frequently; just ask any restaurant or grocery store. Most of the time, these mistakes are handled relatively easily and do not represent huge issues. The trade situation illustrates that such is not the case for international shipments and, in fact, it may become more of an issue in all markets. Getting the details right is part of the process of becoming less of a commodity-oriented business and more of a value-added business.

In May of 2007 the OIE (international animal health organization) recognized the U.S. as a controlled-risk country for BSE. The U.S. is now trying to get all of our trading partners to accept this status which implies removal of age restrictions for trading. It will likely take some time yet but this would allow for better and more consistent access to beef markets.

U.S Beef Imports

2007 beef imports are projected to total about 3.2 billion pounds, up about 3.5 percent from 2006. U.S. beef imports occur, not because of a general shortage of beef in the U.S. market, but because of other market factors. The biggest factor is the need for additional processing beef to feed the enormous U.S. appetite for hamburger. Nearly half of U.S. beef consumption is in the form of ground beef. Ground beef uses the trimmings from fed cattle slaughter, which are 50-60 percent lean, and mixes in additional lean beef to raise the lean percentage to a minimum of 70 percent but more often 80-90 percent. Four to six pounds of

lean are required for each pound of fed trimmings to produce ground beef. The additional lean may come from a variety of sources. The principal source of lean processing beef in the U.S. is from cull cows. However, much more is needed than is produced in the U.S. Ground beef companies must either look elsewhere in the world for lean beef or utilize lean from U.S. fed beef. Grinding beef from feedlot animals is inefficient and expensive. It makes more sense to sell fed beef as more valuable muscle cuts and source additional lean beef in international markets.

Four of the five largest sources of U.S beef imports represent primarily markets for various types of processing beef, ranging from grass-fed beef from Australia, Uruguay or Brazil, to dairy cow beef from New Zealand. Through October of 2007, Australia, the largest source of imported beef, accounted for 28 percent of total imports for the year. New Zealand accounted for 17 percent; Uruguay, 13 percent and Brazil about 9 percent of total imports for the January to October period.

The second reason for beef imports relates to the unique relationship between the U.S. and Canada. Through October, 2007, Canada was the second largest source of U.S. beef imports, accounting for about 25 percent of the year to date total. Historically, a portion of beef imports from Canada was processing beef from cull cows for the same reasons as discussed above. However, from mid-2003 through late 2007, imports of Canadian beef were limited to animals under 30 months of age. In November, 2007, the U.S. began allowing, once again, animals and meat from animals over 30 months of age (with restrictions). Nevertheless, the majority of beef imported from Canada is fed beef.

Noting from above that Canada is also the second largest export market for U.S. beef, raises the question of why the U.S. and Canada are bilaterally trading the same products. The answer is two-fold. A small part of the trade is simply fine-tuning the specific product mixes demanded in the two countries. Canadian beef demand is similar to the U.S., consisting mostly of steaks and ground beef, but there are some differences that account for movement of specific products.

The bigger part of the issue is simply a matter of transportation costs and efficiency in marketing. Most of the fed cattle production in Canada is in the western Provinces and most of the population is in the eastern Provinces. Beef from the U.S. Midwest is much closer to Canadian population centers in the east while Canadian beef production in the Prairie Provinces is closer to U.S. West Coast markets than is Midwest beef. It is more efficient to move beef south from Western Canada and north into Eastern Canada. In total, the U.S. is, however, a net importer of beef from Canada, importing, in volume terms, roughly 2.5 times the quantity exported to Canada.

North American Trading Partner: Canada

The Canadian beef cattle industry has endured massive and almost continuous transition since the first BSE case was identified in 2003. The loss of export markets for cattle and beef forced the industry to adapt to radically different market situations and make significant investments. The impacts continue to this day although the recent U.S. rule

permitting animals and meat from animals over 30 months of age comes close to normalizing beef and cattle trade between the two countries.

In the previous 20 years, Canada developed a significant cattle feeding industry to complement cow-calf production and relied on exports of feeder and fed cattle as a major export market. The closure of the border to live animal trade in 2003 forced Canada to invest in slaughter facilities on order to process more cattle domestically. The U.S. border was closed to Canadian fed beef for only a brief period in 2003, although other export markets remained completely closed for much longer. Through 2004 and 2005, Canadian meat packing capacity expanded by 20-25 percent and U.S. imports of Canadian fed beef increased in lieu of live cattle imports. Cow culling during this period was minimal as the first priority was to process the inventory of feedlot cattle and there was simply no place to go with the cull cows. Canadian cattle inventories grew from 13.5 million head in 2003 to nearly 15 million head in 2005 before beginning to decline. Cattle inventories and beef production are expected to contract further in 2008, approaching pre-BSE levels.

U.S. imports of Canadian beef decreased nearly 5 percent in the January to October 2007 period and simultaneously exports of feeder and fed cattle increased once again. Although Canada has more beef packing capacity now, high labor costs, labor shortages and other factors make beef packing in Canada relatively unattractive economically. Additionally, the strong Canadian dollar and high feed costs made cattle feeding in Canada even more unprofitable than it was in the U.S. This led to increased feeder cattle exports in the second half of 2007 and the trend is expected to continue in 2008.

North American Trading Partner: Mexico

A rapidly emerging middle class has dramatically impacted Mexican beef markets in the past decade. More important than modest increases in the quantity of beef consumed are the profound implications of the switch from traditionally consumed grass-fed beef to fed beef. Domestic markets have been unable to meet the demand for fed beef, partly because of the reduced herd size and beef production potential following drought and the devastating peso devaluation in the 1990s, but also because of limited feedlot capacity in the country.

The U.S. has been the major supplier of beef for Mexico and Mexico has been the largest market for U.S. beef since 2004. Beef preferences in Mexico favor end meats and Mexico has found the U.S. to be a very competitive source of chucks and rounds. For the U.S., the Mexican demand for end meats is very complementary, providing a higher valued market for products which are in surplus and are relatively low value in the U.S. Weaker economic conditions and an abundance of competing meats in Mexico reduced Mexican imports of U.S. beef in 2007 and may hold 2008 imports to similar levels.

For many years, Mexico has exported feeder cattle to the U.S. Mexico has a competitive advantage in producing calves but a disadvantage in cattle feeding and beef processing. Although Mexican wholesale beef prices have compared favorably to U.S. beef prices in recent years, Mexican calves are higher valued in the U.S. market, especially with cyclically strong U.S. cattle prices. Mexican exports of feeder cattle have averaged almost

1.3 million head annually from 2003-2006, a rate that is not sustainable. Feeder cattle exports from Mexico dropped roughly 13 percent in 2007 despite attractive U.S. cattle prices. The need to rebuild Mexican cattle inventories, combined with limited expansion of Mexican feedlot capacity will likely temper Mexican feeder cattle exports in the next year or two.

Major Exporters to Watch: Brazil

Brazil has emerged in recent years as the largest beef exporter in the world, surpassing the U.S. in 2003 and Australia in 2004. Brazil has the largest commercial beef herd in the world and is the second largest beef producing nation, after the U.S. Brazilian beef production and exports have both increased dramatically in recent years. Brazil is currently exporting about 25 percent of beef production. Brazil is a major supplier of beef to Europe and more recently to the Russian Federation. Brazilian beef exports to the U.S. represent only about 5 percent of total exports. Brazilian influence is also growing in other countries with the purchase of Swift, the third largest U.S. beef packer, and recently a large investment in Australian beef facilities. Brazil and other South American countries continue to wrestle with sporadic outbreaks of Foot and Mouth Disease (FMD) although there have been no recent outbreaks.

Major Exporters to Watch: Argentina

Argentina's presence in global beef markets is somewhat diminished at the current time and likely to remain so for the foreseeable future. Argentina recovered impressively after the FMD problems in 2001, but the Argentine government has recently emphasized domestic beef consumption to the point of restricting beef exports in 2006 and 2007. Argentina currently exports 15-17 percent of beef production, mostly to Europe, down from over 23 percent in 2005. Argentine beef consumption per capita is the highest in the world (nearly 150 pounds, carcass weight basis) and changes in beef prices affect the overall inflation rate in the country, something of great concern to the government. Government attempts to limit exports and control domestic prices will likely lead to stagnant or reduced production and exports in the future. The recent election of the wife of the former president to succeed him suggests that recent policy direction will not change dramatically in the near future, although the sustainability of many of the current macroeconomic policies are certainly questionable.

Major Exporters to Watch: Uruguay

Uruguay is a small country with a small (by global standards) cattle industry. However, the cattle industry is a huge component of the Uruguay economy and the country has a very progressive and proactive partnership between the government and the industry. Beef consumption is important in Uruguay (per capita consumption is second only to Argentina, at about 123 pounds, carcass weight basis) but exports are even more important with roughly 80 percent of production exported. The country has been successful in controlling disease and assuring trading partners with a comprehensive animal ID and tracking along with internationally certified processing facilities and procedures. For example, although Uruguay is not certified FMD free and is, in fact still vaccinating for FMD, the

country is permitted to export boneless fresh beef to the U.S. under very specific and controlled conditions. Uruguay has been a more important source of U.S. beef imports in recent years, with the U.S. accounting for over 50 percent of beef exports from Uruguay. Other important markets include the European Union and Canada, with Mexico likely to be a more important market in the future. Uruguay has capitalized on opportunities resulting from the various problems that have impacted Brazil and Argentina in global beef markets.

Major Exporters to Watch: Australia

Australia was historically the world's largest beef exporter but lost that title to Brazil in 2004. The Australian beef industry remains export focused with nearly two-thirds of beef production exported. The U.S. typically accounts for about 30 percent of Australian beef exports. Other major markets include Japan and South Korea with smaller quantities exported to a variety of other Asian markets. Australia has faced persistent drought conditions since 2002 that forced some herd liquidation in recent years. Intermittent marginal improvement in forage conditions in 2007 has helped stabilize herd inventories but beef production and exports are expected to decline in 2008. However, if drought conditions worsen, beef production could increase temporarily in the face of drought-forced liquidation.

Australia has enjoyed a dominant position in Japanese and South Korean beef markets since the U.S. was excluded in 2004. Some decrease in future Australian beef exports is anticipated as the U.S. regains access and market share in those markets. Australia has a small feedlot industry, largely financed with Japanese investments, and oriented to exporting higher quality beef to Japan. The sector struggles with limited and expensive grain supplies and is currently operating far below capacity. The prospects for high grain prices suggest that the situation will not improve in 2008.

Major Exporters to Watch: New Zealand

Beef production in New Zealand is mostly a product of the dairy industry. In fact, dairy production on the island nation is increasing at the expense of the sheep and beef cattle industries. Despite being a rather small country, New Zealand is the 6th largest beef exporting country by virtue of exporting nearly 80 percent of annual beef production. The U.S. is the largest market for beef exports, representing roughly half of total exports. Other important beef markets for New Zealand including South Korea and Japan, with smaller quantities exported to Canada, Taiwan and Indonesia.

Other Markets to Watch: European Union

The European Union now consists of 27 countries with the admission of Romania and Bulgaria in 2007. Historically a beef exporter, the EU has emerged as a significant net importer in recent years. Part of this change may reflect the characteristics of new EU member countries but it also reflect changes in EU production (due to policy reform) and the elimination of beef stocks through the 1990s. Most EU imports are from South America. Despite being a net importer, EU countries export beef to the Russian Federation, other eastern European and some Middle Eastern countries. EU beef consumption has stabilized in

recent years after being rocked by BSE and the FMD outbreak in 2001. Britain experienced two small FMD incidents in 2007 that had minimal market impact compared to the 2001 disaster. The difference in consequences illustrates the value of proactive and aggressive response to an outbreak.

Other Markets to Watch: Russian Federation

Beef production continues to decline in the Russian Federation due to inefficiency and poor financial returns. Meat demand continues to exceed domestic production and imports have increased, accounting for 43 percent of 2007 beef consumption. Although Russia is trying to stimulate domestic beef production in the coming years, cattle inventories and beef production are expected to decline in 2008. The Russian Federation offers relatively limited export potential for U.S. beef for a variety of reasons. The U.S. is poorly located to export to Russia compared to Europe and even South America. Moreover, the type of beef preferred and the relatively low value offered in the Russian market limit U.S. export opportunities.

Other Markets to Watch: India

India has the largest cattle herd in the world, estimated at 282 million head in 2007. However, 80 percent of India's population is Hindu, who do not consume beef and some 20 percent of all Indian consumers are strict vegetarians. Per capita beef consumption is about 3.5 pounds per year and beef is the least preferred (and cheapest!) meat to be found in the market. Nevertheless, India is the 7th largest beef producer and the 4th largest beef exporter in the world. Most of the beef production is buffalo, which are produced for milk, meat and work. Indian beef production and exports are expected to continue growing in coming years.

Other Markets to Watch: China

Like many other sectors of the Chinese economy, beef production (and consumption) has grown dramatically in recent years. Beef consumption is still relatively low but has increased from less than 10 pounds to over 13 pounds per capita in the last five years. Considering the vast population of China, this represents a huge increase in total beef consumption. China is a minor beef exporter at the current time and imports small amounts of specific beef cuts. The U.S. has, thus far, been unable to reach an agreement to resume imports of U.S. beef since China closed the border due to BSE. The U.S. is holding out for Chinese recognition of OIE standards. Like many developing countries, China, despite its huge resource base, could easily have a situation where food demand exceeds production capability and thus represent a huge potential market for food. Also similar to many developing countries, meat consumption is likely to be one of the fastest growing food market segments with consumers upgrading to higher quality proteins as income allows.

Food as a Social Platform

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Food just ain't what it used to be.

Food no longer is viewed essentially as a source of nutrients and eating as a source of pleasure. For many people food has become a way of defining themselves.

In short, food has become a social platform. The Yankelovich Monitor – a major ongoing study of consumer lifestyle trends and values - finds that not only has food become a social platform, but consumers have developed what the Monitor calls a passion for precision. That is, a desire for products that exactly fit their lifestyle wants and needs; products that define their values.

We have come to the point where an old saying is in need of revision. Instead of "you *are* what you *eat*," society is moving to a new perspective – "you *eat* what you *are*."

Consumers increasingly are viewing food through the lens of a heightened consciousness of the environment, nutrition, health and safety. They profess to want to know where their food comes from and how it is produced. They believe in good foods and bad foods. They want to be able to choose precisely those foods that make the statement they wish to make about themselves. And food marketers are responding to that with a variety of niche products such as organic, natural and locally grown.

The Gospel of Food

In his insightful book about American foodways, "The Gospel of Food," sociologist Barry Glassner notes that food and dietary patterns have become more like a religion.

> "Every society has had its food preferences and prohibitions, usually dictated by religious teaching. Judaism and Islam prohibited pork; Catholicism decreed fish on Fridays. The difference today is that for huge numbers of people, *eating* is a religion. We worship at the temple of celebrity chefs. We raise our children to believe that certain foods are good and others are bad. We engage in elaborate rituals in preparing meals at home and describe ourselves as sinful if we order a creamy dessert when we eat out. We even believe in miracles. In recent surveys, nine out of 10 Americans said they believe certain foods have benefits that go beyond basic nutrition."

Glassner points out that exactly which foods and benefits people believe in varies greatly. Vegetarians believe a meatless regimen can prevent almost every serious problem from heart disease to world hunger. Followers of the late Dr. Atkins believe that protein is a magical potion for weight loss and longevity. Americans who pursue a green lifestyle are

being persuaded that giving up meat is the answer to reducing greenhouse gas emissions and halting global warming.

Glassner also offers the concept of the Gospel of Naught – the view that the worth of a meal lies principally in what it lacks.

So, forget about foods high in vitamins, minerals and protein and foods that supply fiber… it doesn't matter. Foods are only good if they have little or no salt, sugar, fat, calories, carbs, preservatives and additives. Foods are good if they are organic or natural, if they have been produced without hormones, antibiotics, chemical fertilizers, if they are produced from humanely and ethically raised animals. Foods are good if they have a small carbon footprint, if they have low food miles, if they are locally grown.

Some of the focus on the religion of eating is being driven by the Boomers – still a powerful market force. Susan Reimer of the *Baltimore Sun* captured the Boomer view of food in August 2007 – Boomers want food to improve them as well as reflect who they are: "We want dinner to heal us, to postpone aging and prevent disease. We want our food to be farm-raised, wild-caught, free-range, grass-fed, corn-fed, sustainably fished, grown without pesticides, hormones or antibiotics and prepared without additives, chemicals, high-fructose corn syrup or too much salt."

An August 2007 *Food and Wine* article also reflected the appeal of the Gospel of Naught by noting that a number of vegetarians are starting to eat meat again – but only humanely, ethically and naturally or organically raised meat; meat raised in a way that is kind to the animals, kind to the land and supportive of small-scale farming. This kind of eating makes a social statement these people feel reflects their values.

The New Greening of America

The growing environmental consciousness of America has been much in the news this past year, and several magazines have devoted entire issues to the subject. This consciousness often is called the "new" greening of America, apparently in deference to Charles Reich's 1970 book – The Greening of America – that offered the failed prediction of a new and pervasive environmental and community consciousness.

The new greening of America has created consumer attention to global warming (for example, Al Gore's documentary won an Oscar). A recent United Nations Food and Agriculture Organization report claimed worldwide livestock production is a greater source of greenhouse gas emissions than automobiles. It also has resulted in an emphasis on eating locally (even, according to the March 12, 2007 issue of TIME, to the exclusion of eating organically). In testament to the long-term trend of interest in local food, the number of farmer's markets in the United States doubled between 1994 and 2004.

The relevance of this for the food industry has been predicted by trend spotters for several years – consumers increasingly want to know where their food comes from. But, in fact, most consumers really *don't* want to know (in any detail) how their food is produced,

especially their meat. What some consumers seem to want is reassurance that their food is okay.

They want to be reassured that their beef was from animals that were raised humanely, were well-cared for, were not given chemicals (antibiotics and hormones) that could have possible human health implications and were produced from a sustainable agricultural production system. What exactly constitutes sustainable agriculture is subject to wide interpretation. Frankly, no farmer or rancher wants to practice agriculture that is not sustainable. But, generally, sustainable agriculture is considered to be the opposite of industrial agriculture. And industrial agriculture is increasingly being characterized as "factory farming."

NCBA's Checkoff-funded research has found that, for some consumers, organic or natural foods represent a shortcut to peace of mind. These consumers believe that if they choose organic or natural foods they don't have to worry about whether their food is okay and can ignore all the scary claims about "factory farming" and food production.

Sustainability and Corporate Social Responsibility

Both food producers and food marketers are feeling pressure in regard to sustainability. Companies have begun to focus on what is called Corporate Social Responsibility (CSR). CSR is a concept that promotes making decisions and taking actions that will benefit customers, employees, shareholders, communities *and the environment*. A similar concept is Sustainable Development that argues companies should take into account more than profits and dividends. Specifically, when making decisions, corporations should factor in both short- and long-term social and environmental consequences.

Companies are taking CSR seriously. For example, in 2006 McDonalds Corporation released a 70-page, 4-color comprehensive corporate responsibility report that featured an analysis and review of the company by a group of McDonalds "fellows" – MBA students from the University of California-Berkeley. We are seeing increased focus on CSR by food companies.

But, practically speaking, the greenie definition of sustainable also is seen as unable to sustain the feeding of an ever-growing population. Even Whole Foods, the retailing giant that has been a centerpiece of the natural and organic movement and trades heavily on that image, could not have achieved its growth without its stocking its shelves primarily with products from so-called industrial (and international) agriculture. In fact, Whole Foods CEO, John Mackey, said, "There's an assumption that small is beautiful and big is industrial and that's not necessarily the case."

Of course, Mackey, a vegan, also has said, "These 'factory farm' operations need to be eventually outlawed, in my opinion, and this is where major change is needed in the organic regulations."

The Fuzzy Spot

Given the rise of the Gospel of Naught, what is facing the beef industry? The fundamental issue involves effectively telling the beef production story. The Beef Industry Long Range Plan 2010 lists telling the beef production story as an important action under its priority of creating industry sustainability (a different view of the issue) through a favorable U.S. business climate. It is important for the beef industry to tell the story of modern beef production.

The problem is relatively simple to explain. Consumers don't know how beef gets from the pasture to the plate. Consumers tend to see beef at the polar extremes of the production chain. They see cattle grazing peacefully in a pasture as they drive down a highway. Their next encounter with beef is a set of choices at the meat case or a steak on their plate. In between the pasture and the plate is a knowledge vacuum we call the Fuzzy Spot.

The operating principle of the Fuzzy Spot is captured in a word coined by Stephen Colbert of TV's "The Colbert Report" - Wikiality (derived from the online encyclopedia Wikipedia). The essence of Wikiality is that something is true if enough people agree it is true. The more something untrue gets repeated, the less likely it is to be questioned until it reaches the point it is considered conventional wisdom. Thus, Wikiality.

The Fuzzy Spot has become a battleground. Journalist Walter Lippman once said, "We are all captives of the pictures in our heads." Modern marketing has refined that into the science of positioning and of social (cause related) marketing, but the psychological principle remains the same. Activists discovered the potential of the Fuzzy Spot some years ago. The activists have been working aggressively to fill the information void with as many bad pictures as they can. The objective is to convince consumers the steak on their plate comes at a high cost – in terms of health, in terms of safety, in terms of the environment. The multitude of activist themes being trumpeted in the Fuzzy Spot include the evils of "factory farming" such as animal cruelty, hormones, antibiotics, pesticides, mad cow disease, *E. coli*, cancer, heart disease and water and air pollution.

Some niche marketers also have discovered the Fuzzy Spot. These marketers see safety, nutrition and animal care as exploitable marketing advantages. When marketers play in the Fuzzy Spot, they use many of the same themes as the activists but with a twist. They promote the idea that their natural/organic/grass-fed products avoid the evils of "factory farming" and produce a safer more nutritious type of beef. In short, if you like beef, you can feel good about it if you choose their products. They are offering that shortcut to peace of mind but you'll pay more money to take the shortcut.

The result of all this is general consumer confusion. True, the U.S. Department of Agriculture (USDA) has established standards for organic products and if beef carries the certified organic label, consumers can find out how it was produced. USDA also recently has published a definition for grass-fed and a proposed definition for natural beef. But a set of voluntary standards and process-verified programs won't reduce consumer confusion brought on by the claims being made in the Fuzzy Spot. It certainly hasn't for organic beef. NCBA

research found significant consumer confusion about the differences between organic, natural, grass-fed and grain-fed beef.

Playing in the New Environment

So, what's the solution? The beef industry has to play in the Fuzzy Spot, too. But it has to play fair. It has to be accurate and stand on science. It has to tell the beef production story in a way that is understandable and credible to consumers, to media, to industry stakeholder organizations. It has to figure out how to counter Wikiality with Reality. And it has to accomplish this, to the extent possible, using experts at beef production…. the beef producers themselves.

NCBA's consumer research found a long time ago that cattle farmers and ranchers are credible with the public. They are viewed as honest, hard-working and an embodiment of American values. Nobody knows beef production like beef producers and nobody is more credible to tell that story.

To help beef producers tell their story, NCBA has established a program called Beef - From Pasture to Plate. It is the story of cattle producers' commitment to providing wholesome beef. There is a range of activities associated with the program, and a major piece can be viewed at: www.BeefFromPastureToPlate.org.

And just like the county fair, we expect this program to get bigger and better every year.

NCBA Issues Update – January/February 2008

Immunity and Vaccinations

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Vaccination programs are an integral part of a total herd health program. Every producer needs to consult their Veterinarian to design a vaccination program that fits the need of their specific operation and management practices. Administering a vaccination does not equal immunity. To understand how a vaccination program works, we need to have a basic understanding of how vaccines work and how the immune system responds to a vaccine. This greatly depends on the type of vaccine used, the route of administration and the timing of the primary and booster vaccination. We also need to have a basic understanding of what factors influence the immune response. I will explain in very general terms the basic immunology of vaccination and why the type of vaccine, route of administration and timing of the vaccination can affect the ability of the animal's immune system to respond to a vaccination.

Type of Vaccine

The basic types of vaccines (generally speaking) are either viral or bacterial, depending on what causes the disease. Vaccines are composed of components of the disease causing agent (killed) or are altered (or modified) live vaccine. Modified live virus (MLV) vaccines are live viruses that have been altered in such a way that they cannot revert back to the virulent (or disease causing) form of the virus. There are a few modified live bacterial vaccines used in animals. The modified live vaccines are presented to the immune system in a very different manner when compared to a killed vaccine and they influence the immune response by the animal very differently.

Route of Administration

The route of administration refers to the site where the vaccine is introduced into the animal's body. Intramuscular (IM), subcutaneous (Sub Q), or intranasal (IN) are the most common routes and vary for many reasons. The route of administration can change the way the vaccine is presented to the immune system and therefore can alter the immune response. It is very important that the route of administration be strictly as the label directs. Vaccine failure can result if the route is incorrect. Beef Quality Assurance program guidelines advise that when given a choice of IM or Sub Q, always administer the vaccine or medication Sub-Q.

Timing of Vaccination

Timing refers to the when the first, or primary, vaccination and when the second, or booster, vaccination is given. The amount of time between the primary and booster vaccination is important, as very little resistance to the disease develops after the primary vaccination. The booster vaccination generally confers a much longer lasting immune response. The timing of vaccination is also important because you want the immune response

to peak just prior to exposure to the disease causing agent, for instance as occurs during shipping.

Immunology

Most vaccines contain either the disease causing agent in a modified form or components of the disease causing agent. The piece or area of the agent that stimulates an immune response is called an antigen. This antigen is presented to the immune system in a variety of ways depending on the type of vaccine and route of administration. When presentation of the antigen occurs for the first time either due to primary vaccination or exposure to disease, the immune response is focused on forming memory calls. Memory cells are specific types of cells that allow the body to respond quickly if the antigen is presented at a later date. The development of memory takes most of the immune response, so only a small amount of antibodies are formed the first time, as a result resistance to the disease is minimal. Some memory cells have a long life span; others have a shorter life span. This is why timing of the vaccination is so important. Booster vaccinations create a much larger and longer duration of immune response because memory has already been created. This is why one vaccination is usually not protective and a booster is required for most vaccinations. The idea is to stimulate the immune system so antibodies are present at a level in the body that is protective if exposure to disease occurs. Disease can occur if disease challenge exceeds the protective level or if the level of antibodies is below protective level. So why do vaccinated animals still get sick? There are many reasons why vaccinated animals break with disease. The basic reason is disease challenge exceeded the base immunity of the animal. This occurs usually because the animal failed to respond fully to the vaccinations due to stress, improper vaccine type, timing or route of administration, or improper handling of the vaccine. Some vaccines, especially MLV's, must be handled very carefully as exposure to heat or sunlight or being mixed too long prior to use can cause a loss of effectiveness of the vaccine. All vaccines must be kept cool even while being used. When everything is done correctly, some animals fail to mount or create an immune response. Factors contributing to this failure are stress, poor nutrition, micro and macro mineral imbalance or deficiency, parasitism or low blood protein. Poor overall health can cause the animal to not respond fully to vaccination. By vaccinating prior to stress, we allow the animal to develop the immune response before challenge takes place. Vaccinations, when done properly, are the best tool we have to prepare the animal's body to respond to disease challenge so we must use this tool properly to maximize the development of the immune response.

Guidelines for calf vaccinations

Any vaccination program must be developed specifically for each individual operation. Programs may not vary between operations in a given area, but should consider management styles when being developed. You must consult your Veterinarian to help you develop a vaccination program for your operation. Below are my suggested goals for a vaccination program for calves up through the weaning period and starting at branding.

Weaned feeder calves

Shipping fever vaccines: IBR, BVD, PI3, BRSV- at least two and preferably three (MLV)
Pasturella- one or two vaccinations
Blackleg- one or two doses 7- way (+ H.Somnus?)
Deworming

Weaned replacement heifers

Same as above but need three MLV vaccinations
Repro vaccinations- Vibrio Leptospirosis (and Brucellosis?)

Remember to consult your Veterinarian to develop a program specific to your operation!

Calf Management: Weaning to Shipping

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"Backgrounding" is a management approach designed to prepare young cattle to best withstand the physical and psychological stresses of shipping and entering the channels of trade. Weaning, shipping, commingling, and dietary change can all impose significant stress on cattle, potentially causing reduced performance and increased sickness. A critical component of backgrounding is a well-planned vaccination program to help calves develop a strong immune system before a substantial disease challenge occurs. It is important to minimize stress to give calves the best opportunity to respond to vaccines and develop the immune response capabilities necessary to fight disease challenges that typically occur following shipping.

Stress management in cattle has two major components: (1) management of the cause of stress and (2) management of the quantified changes seen in the animals caused by stress. The most stressful time in the life of most calves that follow the conventional marketing channels is from weaning through the first month in the feedlot. Steps can be taken by producers to minimize stress in calves prior to and during the weaning process, and between weaning and shipping. Such actions can enhance subsequent performance and profit.

This paper will address weaning and post-weaning management approaches to minimize stress in calves prior to shipping. Vaccination guidelines will not be discussed; however, producers are encouraged to consult their veterinarian to develop a total herd health program that is most practical for their cattle and management system.

Weaning Considerations

Weaning is one of the most stressful events in a calf's life. Minimizing weaning stress can yield improved calf health and weight gain. The primary stressors that can affect calves at weaning are separation from their mother and moving to a new environment. When evaluating potential weaning methods, facilities, labor, and feed resources should be considered. Producers should then decide which protocol within the resource parameters is most likely to minimize stress on the cows and calves, yet cost-effectively best prepare the calves for the next stage of production.

Fenceline Weaning

California researchers conducted a three-year study to compare weaning calves while allowing fenceline contact with their dams (fenceline-weaning) to non-weaned calves or calves weaned and completely separated from their dams. Results of this study (Table 1) indicate that fenceline-weaned calves show less behavioral stress (time spent eating, walking, and resting) than calves abruptly separated from their dams. During the first three days after weaning, calves weaned on pasture away from their dams were observed walking almost 3-fold more frequently and bawled twice as often compared to fenceline-weaned calves. Additionally, fenceline-weaned calves spent more time eating and resting. Aside from

bawling, fenceline-weaned calves exhibited similar behavior to non-weaned control calves. Seven days after weaning, all weaned calves in the study were managed together. Fenceline-weaned calves gained 95% more during the first two weeks after weaning than calves totally separated from their dams (47 vs. 24 lb gain, respectively), and retained the weight advantage through 10 weeks post-weaning.

Table 1. Average percentage of observations in which calves exhibited various behaviors on days 1 through 3 (yr 1, 2, 3) and average cumulative weight gain at 2 and 10 weeks post weaning (yr 1 and 3; Price et al., 2003).

	Not Weaned	**---Pasture Weaned---**		**---Drylot Weaned---**	
	Control	**Fenceline Contact**	**No Contact**	**Precon. to Hay**	**No-Precon to Hay**
Behavioral	----------% of observations----------				
Eating	41[a]	37[a]	24[bc]	29[b]	22[c]
Walking	9[a]	10[ab]	28[c]	10[ab]	15[b]
Resting	23[a]	23[a]	16[b]	22[a]	21[ab]
	----------# vocalizations/hour----------				
Bawling	0.1[a]	216.7[b]	434.6[c]	371.2[bc]	518.2[c]
Performance	----------weight gain (lb)----------				
Weaning – 2 wks	44[a]	47[a]	30[b]	23[b]	20[b]
Weaning – 10 wks	143[a]	110[b]	91[c]	79[c]	82[c]

[abc]Means with different superscripts within rows differ P<0.05

In 2006 and 2007, beef calves at the Corona Range Livestock Research Center were fenceline weaned for 7 days. Other than the challenges associated with keeping cows and calve separated with marginal fencing, the experience has been positive. During both years calves gained weight during the 7-day fenceline weaning period (Table 2). It is important to note that during both years gathering calves required less time at the end of the 7-day period, so calves likely had slightly more fill at the end of the 7-day period than on the day they were weaned. Nevertheless, calves maintained their body weights, and outward signs of stress were minimal.

Table 2. Performance of fenceline-weaned calves at the NMSU Corona Range Livestock Research Center

Year	**Weaning Wt.**	**7-Day Post-weaning Wt.**	**Difference**
2006	468	484	16
2007	520	524	4

Allowing fenceline contact between calves and their dams for four to seven days after weaning can lessen stress and minimize post-weaning performance decline. However, it may not always be possible to fenceline wean calves. In situations where fenceline weaning is impossible or impractical, cost-effectively minimizing stress is still important.

Tips to Minimize Stress from Weaning to Shipping

- Provide calves access to the weaning area (pen, trap, or pasture) a few weeks prior to weaning so calves do not undergo the stress of environment change at weaning.
- Allow fenceline contact between calf and dam for four to seven days following weaning. Fences should be sturdy and allow nose to nose contact while preventing nursing.
- If fenceline contact is not practical, move cows far enough that they cannot hear the calves bawling.
- Move the cows to a new location when cows and calves are separated at weaning. Do not move the calves.
- If weaning in a drylot or corral, place feed bunks, hay, or water troughs along the fence to minimize perimeter walking.
- Do not castrate, dehorn, or brand calves at weaning. These practices should be completed at least three weeks before weaning and preferably prior to three months of age.

Duration from Weaning to Shipping

Since weaning and shipping are both stressful events in a calf's life, the duration from weaning to shipping is important. By separating these stressors, the combined immunosuppressive impact may be reduced. The number of days separating weaning and shipping (i.e., 45 days or more), when combined with a sound vaccination protocol, adds value to calves and is rewarded in the marketplace. In fact, price premiums for "VAC-45" calves marketed through Superior Livestock Auction video sales increased every year from 2000 to 2004, with annual average price premiums ranging from $3.66 to $7.91/cwt (King and Seeger, 2005). Justification for such premiums are supported by the analysis of New Mexico Ranch to Rail data which showed that steers weaned 41 days or more before entering a feedlot generated greater net income during finishing than steers backgrounded 21 to 40 days, or less than 20 days (Figure 1). These findings also support the premise that implementing a backgrounding program of 45 days or more improves finishing profit potential. However, studies evaluating backgrounding calves have typically focused on programs less than 40 days, and controlled experiments evaluating the impact of different backgrounding approaches on performance and profit through harvest are limited.

Post-weaning Management Approaches

Ranch resources, management programs, cattle-types, and potential markets vary, so a single post-weaning management program does not fit all operations or market environments. Producers must define their objectives before implementing a post-weaning management program. For example, a producer may background calves with the intent of selling for a premium immediately after backgrounding, being most interested in low-cost gain. On the other hand, a producer may plan on retaining ownership of calves and choose to background calves for the sole purpose of optimizing calf health and condition to improve overall performance and profit through harvest; therefore, being less interested in weight gain during backgrounding. The backgrounding approach may be vastly different for these two scenarios.

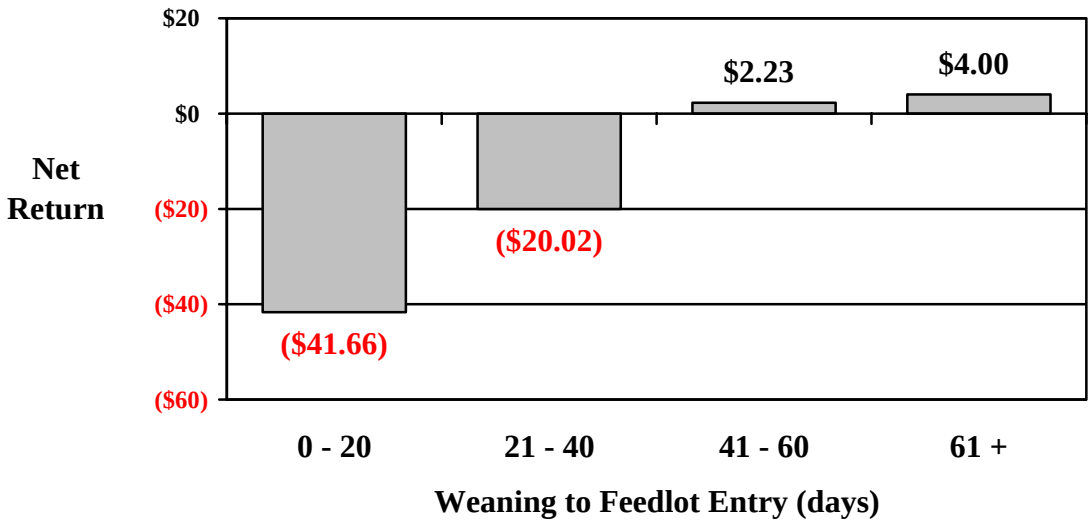

Figure 1. Impact of time separating weaning and feedlot entry on net return of steers in the New Mexico Ranch to Rail program from 2001 to 2004

Generally, pasture-based backgrounding programs are the least stressful because the environmental change from pre-weaning to post-weaning is minimal. However, calves can be fed a forage-based or concentrate-based backgrounding ration and confined to a drylot for the entire backgrounding period. Some trade-offs between backgrounding management approaches exist.

Pasture Backgrounding

+ less environmental change
+ less dietary change
+ less dust or mud control
+ lower cost
- often less gain
- not trained to eat from bunk

Drylot Backgrounding

+ often more gain
+ trained to eat from a bunk
- greater environmental change
- more dust or mud control
- greater feed cost

Since premiums are paid for backgrounded calves, but very few controlled studies evaluating differences in post-weaning management approaches have been reported, a study at NMSU to was conducted to compare low-input pasture backgrounding approach to a high-input drylot backgrounding approach. In this study performance and profit were evaluated during the backgrounding and finishing phases. An overview and results of are below.

NMSU Pasture vs. Drylot Backgrounding Study

Over 3 years, 250 calves were used to compare a low-input pasture backgrounding system to a high-input drylot backgrounding system. Performance and profit of calves during the backgrounding and finishing phase were evaluated. Treatments: 1) **high-input drylot**

backgrounding system (corn/wheat midds-based pellet plus 1.5-2.5 lbs of alfalfa hay/day) or 2) **low-input pasture backgrounding system** (native range pasture plus 1.25 lb/day of a 32% CP range cube delivered 3×/week). All calves qualified as "VAC-45", but premiums for backgrounding were not applied to prices. After backgrounding, all steers were fed at a commercial feedlot, then sold on an individual carcass basis

Results: Backgrounding Phase. The drylot backgrounded calves gained 0.32 lb/day more during backgrounding, and were worth $6.90/hd more. The higher value of the drylot backgrounded calves was offset by $52.76 greater cost for drylot backgrounding. Consequently, net income during backgrounding was $44.59 greater for pasture backgrounded calves even though they gained less weight than DLOT calves. A final price premium of $5.00/cwt would have been required for the drylot backgrounding system to be profitable in the market conditions of the study; however, the pasture backgrounding system was profitable without a premium.

Results: Finishing Phase. There were no differences in overall feedlot ADG, finished body weight, DOF, or any measured carcass characteristics. There was a tendency for drylot backgrounded steers to have more sickness (48% vs. 34%) than pasture backgrounded steers. The drylot backgrounded steers also had greater death loss (7.6% vs. 0%), indicating that the drylot backgrounded steers likely experienced some degree of suppressed immune function as compared to pasture backgrounded steers. During finishing, the pasture backgrounded steers profited $103/hd more than the drylot backgrounded steers. Approximately $70/hd of the profit difference between treatments resulted from death loss, and the remaining $33 difference occurred primarily because pasture backgrounded steers had numerically greater carcass weight and prices than drylot backgrounded steers.

In summary, the pasture backgrounding system yielded more profit during both the backgrounding and finishing phases. Additional research is currently being conducted to compare different pasture-based approaches (self-fed vs. cake).

Ohio Comparative Weaning/Backgrounding Study

Recently a study was conducted in Ohio that compared health performance of 1) shipping calves at weaning, 2) calves backgrounded for 30 days on pasture (fescue pasture + supplement) with fenceline contact to their dams for the first 7 days, and 3) calves backgrounded for 30 days in a drylot (hay + supplement) with not contact to dams. Calves were placed in a feedlot following weaning or backgrounding and monitored for 28 days. During the 28-day receiving period, 15% of the pasture backgrounded/fenceline weaned calves were treated for sickness, whereas 28% of the calves shipped at weaning and 38% calves backgrounded in a drylot were treated for sickness. The fenceline-weaning, pasture-based backgrounding approach better prepared calves to withstand the immune challenge they faced during the feedlot receiving period.

There are differences of opinion in the industry regarding how calves should be managed between weaning and shipping. It is also clear that management approaches that work well for some calves may not be the best approach for calves from a different source, management system, or region. However, there is mounting scientific evidence indicating

that keeping calves on pasture between weaning and shipping may render calves more competent to withstand subsequent immune challenge.

Table 3. Impact of backgrounding system on performance and profit during the backgrounding and finishing phases *(NMSU Study)*

	Backgrounding System	
Item	**Drylot**	**Pasture**
Backgrounding Phase		
# of head	125	125
ADG, lb/day	1.42	1.10
Total Cost, $	66.77	14.01
Net Income, $[a]	(28.87)	15.72
Finishing Phase		
# steers	66	67
% Treated for sickness	47.6	34.3
% Death loss	7.6	0.0
Net Income, $	(98.33)	4.68

[a]A "VAC-45" price premium was not included in the analysis

Summary

Common events like branding, weaning, shipping, and receiving at a feedlot are stressful to calves. Producers should take steps to minimize stress to calves prior to shipping. Reducing stress influences the health and well-being of calves, ultimately enhancing the potential for improved performance. To minimize stress of weaning, producers are encouraged to consider allowing fenceline contact between the cow and calf for a few days following weaning. Producers are also encouraged to consider backgrounding calves prior to shipping to separate weaning and shipping stress, and allow the immune system to more fully respond to vaccination prior to commingling. A sound vaccination program is critical to preparing calves for disease exposure that is likely to occur at the commingling point, and should be developed in consultation with a veterinarian.

"I Followed the Guidelines and My Calves Got Sick Anyway: What Happened?"

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Managing Veterinarian, Beef Veterinary Operations
Pfizer Animal Health

Almost everyone in the cattle business has experienced one or multiple disease breaks… even after following professional and thoughtful guidelines. These events often leave the unfortunate victim scratching their head and wondering "What happened?" In some cases, a thorough diagnostic investigation leads to a specific cause for the break (smoking gun); however, many investigative efforts only result in seemingly wasted time, much speculation and major frustration. Rarely is there a single "smoking gun" cause or single "silver bullet" solution. A common response to a disease "wreck" is to change one or all products and hope the situation improves. Many times these changes are misdirected and only serve to confuse the diagnosis of the true cause. Differences in cattle exposure and stress, environmental factors and the ebb and flow of disease challenge in a given environment over time create difficulties in establishing cause and effect relationships. A "secret of the trade" in the pharmaceutical industry is to come in at the end of a wreck and offer a product change solution. Odds are the disease storm will wane and the new product gets credit … possibly unwarranted credit.

Realistic Expectations

Over- reliance on product solutions, without implementing a complete health management program, is a common occurrence and sometimes yields disappointing results. Vaccines and antibiotics should be considered as tools to augment a comprehensive health management program and not THE program. To be truly effective, the program needs to include practical biosecurity measures to prevent disease introduction, biocontainment to limit disease spread, sound nutritional management, parasite control, low-stress animal handling, and proper product handling. In the cowherd, factors such as fetal programming, colostrum composition of the dam and colostral absorption by the calf have potentially lifetime effects on calf health and performance.

The purpose of vaccination is to decrease the <u>risk</u> of clinical disease, not end all disease losses. Vaccines are used to increase the number of animals that would be considered non-susceptible at a given challenge level as compared to the original population. In other words, vaccines generally decrease the spread of disease in a population, but do not protect 100% of individual animals. Vaccines typically do not stop invasion of viruses or bacteria. Physically vaccinating (inoculating) an animal does not always equate to immunization. Since the immunological response is a biologic process, absolute protection does not occur (even when the best products available are administered appropriately) and the protection afforded is never equal in all animals in a vaccinated population. Since the immune response is influenced by a large number of genetic and environmental factors, the range of immune responses in a large random population of animals tends to follow a normal distribution (bell-curve).

Population Dynamics 101

Developing a better understanding of realistic expectations for vaccine effectiveness in a group of vaccinated animals requires some discussion of population dynamics and terminology:

Individual Animal Immunity. Any given animal at a given point in time will have a specific level of immunity (resistance) to a specified antigen based on its environment, immunocompetence, degree of historical exposure (memory), nutritional state and stress level. Immunity or resistance changes over time as the factors that determine resistance change.

Herd Immunity. Herd (Population) immunity is based on the individual immunity of its members and will be less than the most resistant member and more than the least resistant member of the herd. Assuming the resistance level of individuals at a given time point distribute normally, a population mean and standard deviation can be used to describe the distribution of herd members relative to level of resistance. Herd immunity or resistance changes over time as the resistance of the individuals that make up the herd change.

Clinical Disease. Clinical disease can be defined as any readily apparent deviation from a normal state of health. Typically, disease is assumed to be associated with disruption of physiological homeostasis as a result of infectious disease agents. Calves purchased from a sale barn, single-source ranch origin (without preconditioning) or single-source ranch origin (preconditioned) would be expected to have differing levels of disease (deviation from normal) and might have an expected morbidity of 35%, 15% and 5%, respectively.

Disease Occurrence. Disease occurs when an infectious agent comes in contact with and is able to establish itself in a given animal. Two major factors influence this dynamic process: 1) The relative level of resistance of the animal against the invading agent at the time of exposure; and 2) The relative amount and virulence of the invading agent getting to the animal at a given time.

Reproductive Rate (R_0). The spread of disease depends on the reproductive rate (how many new cases arise on average from one infectious animal) of an infectious disease agent. In general at the herd level, the basic reproductive rate of the disease in vaccinated populations should be below 1 to prevent the spread of infection. The higher the R_0 the greater the number of animals that must be immune in order to prevent spread of the infectious agent. If R_0 in a vaccinated population is larger than one, then the vaccine cannot totally prevent the spread of infection and other biosecurity principles must be employed. In one study, R_0 for Infectious Bovine Rhinotracheitis (IBR) using two different vaccines was estimated to be 2.4 and 1.1. Hage et al estimated Ro in a mixed population for IBR at 7. Typically for IBR, at least 86% of the population must be immune to reduce Ro to less than 1. Based on published models for BVD, vaccine coverage for herd immunity needs to be 57% in herds without persistently infected (PI) animals and 97% with PI's present. This clearly illustrates that in the face of BVD-PI exposure, vaccination alone may not control disease.

Some Causes of "Vaccine Failure"

Vaccine Timing

Vaccines are designed to be administered prior to disease challenge. This approach allows for a peak in immunologic responses in correlation with pathogen exposure. An effective immune response from vaccination typically takes several days to several weeks. Generally speaking, the incubation time for Bovine Respiratory Disease (BRD) is 7-10 days. The immune response takes approximately 3-10 days (longer in naïve calves) to kick in and peaks in 2-4 weeks. It has been reported that ~ 75% of deaths due to pneumonia are the result of illness incurred during the first two weeks after arrival. Are these breaks truly reflective of on-arrival vaccine efficacy? Obviously, vaccines should not be blamed for pre-existing disease conditions.

In the case of most killed vaccines, an effective response may not occur until some time after the booster dose, making the actual time of effective immune response several weeks after the initial priming dose.

Animals' Immune Response

As mentioned earlier, populations of animals have substantial biologic variability and subsequent response to vaccination. If we think of a normally distributed "bell-curve" response, we obviously have varying levels of immunity within groups of animals, even under the best health management conditions. Nutritional and parasite status can have a profound effect on the ability of animals to mount an effective immune response. Likewise, pre-existing disease conditions and the presence of immunosuppressive agents such as BVDV (possibly from the presence of BVD-PI calves) may inhibit the immune response. Environmental factors, such as temperatures over 85^0 F, dust, and extreme temperature fluctuations, may impair host response to vaccine.

Vaccine Handling

Biologicals (vaccines) that are mishandled anytime from manufacturing until proper placement in healthy cattle may yield less than ideal results. Mishandling, particularly modified-live vaccines, may render these products partially or completely ineffective. Using vaccines more than one to four hours after mixing, using the same needle to draw out vaccines that were used for a previous injection and using the same syringe to inject modified-live and killed products are examples of practices that may decrease the effectiveness of these vaccines. Off-label mixing of different products, due to differences in pH and diluents, may seriously affect efficacy. Exposure to ultraviolet light, heat and freezing have been shown to have major negative impacts on vaccine performance.

Overwhelming challenge

Sometimes the best products available and handled properly will be given to a group of animals that experience such an overwhelming disease challenge or "piling on" of disease and stressors that "vaccine breaks" still occur. A two-tiered approach to disease control that emphasizes increasing immunity and concurrent decreasing of disease challenge is necessary for consistently favorable vaccine responses. "Piling on" of stressors and/or disease agents

can result in cumulative or additive effects that simply overwhelm the bodies' immune capabilities.

Commingling

When calves from various sources are commingled, the social hierarchy is destroyed, additional stress is imposed and pathogens are readily exchanged. Disease expression is magnified in unstable populations, especially when multiple disease exposure occurs. Increasing commingling decreases population disease stability. Commingling should be considered the root of most population disease problems. "All In –All Out" systems have become the norm in poultry and swine disease control programs. While these type systems are not currently practical in most current marketing and movement programs for beef cattle, basic concepts in cattle flow strategies to reduce commingling should be considered when developing comprehensive health management programs.

Labor Stress

Determining the extent of **Labor Stress** is a key component in any thorough disease investigation. The lack of a sufficient quantity and/or quality of labor to implement an animal health management program is often the "other" stressor causing the entire program to dismantle and substantial disease outbreaks to occur.

Quotes Heard "Down the Road"

"I followed the guidelines (and even added some things) and my calves got sick anyway."

Administration of additional products beyond those recommended by the veterinarian after careful review of the special immunologic, management and economic criteria of a unique operation are often unnecessary and potentially negate the positive effects of the designed program. In some cases, adding gram negative vaccines may result in "gram negative stacking" and create harmful endotoxin levels. In general, increased injections, especially when product efficacy is unproven, serve to unnecessarily increase muscle trauma and soreness. These added "stressors" could contribute to the "piling on" that leads to a disease break.

"The antibiotics were working so well that I quit vaccinating …" and "I switch vaccines every time I have a wreck."

Recent Case Example Sixty (60) Angus ET calves were early weaned at 4-5 months of age in June and transported to a nearby ranch with the same owner. The calves had been vaccinated at 2-3 months of age with modified-live IBR-PI_3–BVD-BRSV, "8-way" clostridial, and "5-way" leptospirosis vaccines and dewormed with pour-on ivermectin. Two to three weeks prior to weaning the calves were vaccinated with modified-live IBR-PI_3–BVD-BRSV, "8-way" clostridial, *Mannheimia haemolytica* and "5-way" leptospirosis vaccines and dewormed with pour-on ivermectin. Two weeks after weaning, a respiratory break occurred with 100% morbidity and 20% mortality. Numerous necropsies were performed. No viruses or bacteria were isolated. The only pathogen isolated on necropsies was *Mycoplasma bovis.* Significant risk factors that may have exacerbated this break were

extremely hot temperatures, very dusty weaning pens, a new and inexperienced caretaker and an apparent temporary lack of access to water.

Determining "What Happened"

Successful management of population disease requires a change from traditional "Diagnosis and Treatment" (seeking the "silver bullet" to treat the 'smoking gun") to a "Risk Factor Modification" approach. With this approach, an attempt is made to identify all risk factors contributing to disease and then modify the risk factors under control of the management team. A records program, appropriate for the operation, is critical to move from perception to reality in disease investigations. In some cases, the most valuable animal on the operation is the one that just died and could provide valuable information to avert a major disease "wreck". Necropsies can be invaluable both as a positive (identifying causative agent) and negative (helping to rule out certain diseases) procedure. Laboratory data is extremely valuable provided the interpretation combines the laboratory results with a thorough knowledge of the animal health management program and analysis of all known risk factors contributing to the disease process.

Summary

Animal health guidelines should be comprehensive, taking into account the unique circumstances of each operation to develop a program that optimizes considerations of immunologic principles, management capabilities and economic realities. Animal health products should be viewed as tools to augment sound health management rather than the backbone of a health management program. Disease (deviation from normal) should be diagnosed by identifying all the risk factors contributing to the disease event and ameliorated by risk factor modification. Rarely is there a "smoking gun" in disease investigations or a "silver bullet" to use when correcting a health problem. Most commonly, thorough investigations reveal there are a series of breaches in health management that produce a "piling on" effect and disease consequences. The proverbial "straw that broke the camel's back" analogy is highly suitable for describing the progression and consequences of population diseases.

National Market Cow and Bull Beef Quality Audit-2007: A Survey of Producer-Related Defects

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The National Market Cow and Bull Quality Audits have provided a benchmark for producer performance in cull cow and bull management over the past 13 years. Changes in auditing methods from the past studies have included data pertaining to animal welfare, traceability, fabrication of cuts, and subprimal evaluation for internal defects. As in the past, the primary phases of the 2007 cow and bull quality audits consisted of interviews and in-plant audits aimed at offering insight into the quality challenges that face today's cull cow and bull industry. Information from this audit, as well as past audits, will allow opportunities for beef and dairy producers to understand value of producing cattle without quality related defects. Using best beef quality management practices are important to the economic status of the beef industry as a whole and play a significant role in maintaining consumer confidence in beef.

In-Plant Packing Plant Audits

Packing Plant Audits (n = 23) were conducted to quantify producer-related defects found at the packing plant level. Seven universities cooperated in the collection. Plants were selected to represent a total of twelve states spanning across the United States throughout the 2007 Fiscal Year. Each plant was audited during the course of one full production day. Data collection was separated into six primary categories: animal welfare and handling, live animal evaluation, carcass defect evaluation, carcass grade data, product fabrication, and animal traceability. All packing plant audit data were segregated, when possible, by cattle type (beef vs. dairy) and by gender (cow vs. bull).

Receiving Audits

Key points:

- It was determined that all truck and trailer loads met the American Meat Institute guidelines for livestock spacing.
- Overall, cattle loads averaged 30 square feet per animal and 34 animals per load. Beef cattle loads averaged 24 square feet per animal and 38 head per load.
- Travel – Less than 1% of the cattle traveled longer than 28 hours.
- All cattle surveyed were trucked an average of 9 hours and 409 miles.
- Beef cattle were trucked an average of 9 hours and 473 miles. The minimum distance traveled by cattle overall was 22 miles.
- The minimum distance traveled for beef cattle was 60 miles.
- The maximum distance traveled for dairy cattle was 1250 miles, while the maximum distance for beef cattle was 1050 miles.

- Trailers – 64% of beef loads arrived on tractor trailers, while 36% came in on gooseneck/bumper trailers, with the same figures applying to all cattle loads. 14% of beef loads traveling in tractor-trailers contained cattle in the doghouse (the rear compartment of potbelly trailers), compared to 16% of overall loads.
- Load sorting – 65% of all loads and 56% of beef loads were single gender. 35% of all loads and 44% of beef loads were multi-gender. 67% of all multi-gender loads were not sorted by gender. 73% of multi-gender beef loads were not sorted by gender.
- Cattle unloading – 65% of all cattle loads had no cattle slip, 70% had no more than 3% cattle slip, and 30% had more than 3% cattle slip. 64% of beef loads had no cattle slip, 73% had no more than 3% cattle slip, and 27% had more than 3% of cattle slip.
- Dead/moribund cattle – A total of 0.24% loads had moribund cattle and 0.04% had dead cattle. Beef cattle loads contained 0% dead or moribund cattle.
- Hot shot usage for unloading – Electric prods were used on 22% of all loads and 32% of beef cattle loads.
- 13% of all cattle loads saw electric prods used on more than 25% of the animals unloaded.
- 18% of beef loads saw electric prods used on more than 25% of the animals unloaded.
- Other driving aids used while unloading – 14% of all cattle loads experienced the aggressive use of driving aids other than electric prods. Aggressive use is defined as making contact with the animal with driving aids such as sticks, paddles, and whips. 15% of beef loads experienced the aggressive use of these other driving aids.
- Hot shot usage while moving cattle to the restrainer – 83% of all plants used electric prods for moving cattle to the restrainer. 65% used hot shots on more than 25% of the cattle as they were moved.
- Other driving aids used when moving cattle to the restrainer – 39% of plants audited showed the aggressive use of driving aids, (aids other than electric prods), when moving cattle to the restrainer. Employee fatigue resulted in an increase in aggressive handling as the day progressed.

Holding Pen Audits

Key points:

- Visible Defects – 69% of all cattle had no visible defects. 72% of beef cows and 76% of beef bulls had no visible defects.
- Abscesses and lumpy jaw – .39% of cattle had abscesses of the jaw/tooth compared with 1% of all cattle in the 1999 audit.
- 1% of all cattle surveyed had abscesses of the knee/hock, down from 2% in 1999.
- As in 1999, 0% of beef cows and 1% of beef bulls had knee/hock abscesses. Hook/pin abscesses occurred in 1999 at a rate of 1% for all cattle surveyed, and in 2007, .5% of all cattle, .35% of beef cows and 0% of beef bulls having hook/pin abscesses. .59% of all cattle, beef cows, and beef bulls had lumpy jaw, the same rates seen in 1999.

- Udder defects – 83.9% of all cows audited had no udder defects, while 89.5% of all beef cows were free of udder defects.
- Reproductive defects – Cows surveyed had a 0.23% incidence of vaginal prolapses and 0.31% incidence of retained placentas. 4.08% of bulls had broken penises.
- Hide colors – 44.2% of beef cows and 52.3% of beef bulls had black hides. The second-most prevalent hide color was red. 32.3% of beef cows and 28.6% of beef bulls had red hides.
- Identification types – 68% of all cattle surveyed had back tags. 60% of all cattle, 57% of beef cows, and 42% of beef bulls had visual identification tags. Metal clips were used to identify 45% of all cattle, 55% of beef cows, and 33% of beef bulls. 8% of all cattle, 6% of beef cows, and 14% of beef bulls had no identification.
- Mud/manure – 57% of all cattle had some amount of mud/manure with 51% of mud/manure located on the legs.
- All cattle improved from only 6% with no mud/manure in 1999 to 43% with no mud/manure in 2007.
- Brands – 76% of all cattle surveyed during the 2007 audit had no brand, an improvement from 1999's 54%.
- Horns – There was an increase in the percentage of polled animals since the 1999 audit, from 77% to 83%.
- Cancer eye – 97% of all cattle had no evidence of cancer eye. Cancer eye has been on a downward trend since 1994, dropping from an incident rate of 8.5% in 1994 to 4% in 1999 and 3% in 2007.
- Visible knots – 92.1% of all cattle surveyed had no visible knots. When visible knots were present 2.6% were in the neck, 4.6% in the shoulder, 0.2% in the top butt, and .50% in the round. 95.7% of beef cows and 98.7% of beef bulls had no sign of knots. 1.8% of beef cows and 0% of beef bulls had knots in the neck area. 2.1% of beef cows had shoulder knots and 1.0% of beef bulls had shoulder knots. The incidence of knots in the round area in beef cows held steady between the 1999 audit and the 2007 audit at 0.3%, but knots in the shoulder area of beef cows rose from 0.3 in 1999 to 2.1 in 2007.
- "The higher incidence of shoulder knots indicates a need for continued education," says Texas A&M's Dr. Jeff Savell. "These knots are likely the result of intramuscular injections of animal health products instead of the recommended subcutaneous injections in the neck area."
- Lameness – 70% of all cattle, 84% of beef cows, and 69% of beef bulls showed no sign of lameness. 4% of all cattle received scores of 4 and 5, considering these animals as very disabled.
- At 16%, fewer beef cows were lame in 2007 than the 27% in the 1999 audit, but more than the 11% in the 1994 audit.
- Similarly, there were fewer lame beef bulls in 2007 (31%) than in 1999 (36%), but more than the 27% found lame in the 1994 audit.
- Muscling – 21% of all cattle audited were inadequately muscled. There were fewer light-muscled beef cows in 2007 than in 1999. In the 1999 audit 44% of beef cows came in with a muscle score of 1. In 2007 that number fell to 14%,

- Body condition score – Cattle were evaluated using the nine-point body condition scoring (BCS) system. A score of 1 means the animal is severely emaciated. A score of 9 indicates obesity.
- 2007 found beef bulls in better condition than beef cows. 95% of bulls and 86% of cows earned a score between 3 and 7.
- Overall there were fewer moderately conditioned beef bulls and cows (scoring 5) since the 1999 audit. 22% of beef cows had a body condition score of 5 in 1994, then 31% in 1999, and now 21% in 2007. The percentage of beef bulls scoring 5 for body condition ranged from 42% in 1994, to 54% in 1999, to 29% in 2007.

Harvest Floor Audit

Key points:

- Dentition – 11.2% of all cattle and 17% of beef cows had 8 extremely worn adult incisors, also known as gummers. 58% of all bulls and cows had 8 adult incisors. Beef cattle came in at 51% with 8 adult incisors.
- Bruises – The 2007 audit found fewer carcasses with bruises than in the 1994 and 1999 audits. The highest incidence of bruising in beef cow carcasses was in the round at 14%, followed by 11.8% FPB, 7% loin, 2% chuck, and 1% rib. Beef bull carcass bruising figures were 14% round, 9% FPB, 6% loin, 2% rib and 1% chuck.
- Injection site lesions – Overall, 94% of carcasses showed no evidence of injection site lesions. 2% of all carcasses had minor injection site lesions that resulted in trims of less than one pound per bruise site. 1% of beef cows and bulls had minor lesions.
- Arthritic joints – 89% of all carcasses in 1999 had no arthritic joints removed. This figure was improved to 94% in 2007 of carcasses. 95% of beef cow carcasses and 91% of beef bull carcasses had no arthritic joints removed. .3% beef cow carcasses had 2 arthritic joints removed.
- Buckshot/grubs – 100% of carcasses audited in 2007 were buckshot-free. 99.95% of carcasses were free of grubs.
- Offal condemnation – More offal was condemned in 2007 than in 1999. 31% of livers were condemned in 1994, 24% in 1999, and 45% in 2007. Of the 45% of rejected livers, 14% were abscessed, 7% were contaminated, 6% had flukes, 5% had T-lang, and 14% were rejected for “other” reasons.
- Whole carcass condemnations – In 2007, when more than 1% of whole carcasses/animals were condemned 0.3% were condemned antemortem and 0.8% were condemned postmortem. No carcasses were condemned due to bruises in 2007.
- Pregnancy – 11% of all cows were pregnant at harvest in 2007, down from 12% in 1999, and 28% in 1994. Beef cows had an even smaller incidence of pregnancy at 10%.

Cooler Audits

Key points:

- Carcass weight – Cow and bull carcasses were heavier in 2007 than in 1999. In 1999 cow carcasses averaged 540.5 lbs. and bull carcasses averaged 858.5 lbs.

- 2007 saw beef cow carcasses averaging 634.9 lbs. and beef bull carcasses averaging 873.1 lbs.
- 21% of all carcasses were (less than 500 pounds) and 7% of all carcasses were too heavy (more than 1,000 pounds) compared to the 46% that were too light and the 27% that were too heavy in 1999. 29% of beef cow carcasses were too light, and 4% were too heavy. 6% of beef bull carcasses were too light, and 19% were too heavy.
- Fat thickness - Fat thickness for all carcasses averaged .22 inches in 2007, lower than the .37 inches measured in 1999.
- Ribeye area – Ribeye area averaged 10-square inches. Ribeye area/cwt of carcass averaged 1.54.
- Marbling – 3% of carcasses were devoid of marbling.
- Lean maturity – 27% of all carcasses were scored as C maturity for lean. 26% of beef cow carcasses and 37% of beef bull carcasses were classified as C lean maturity. In 1999 44% of cow carcasses were D lean maturity.
- Skeletal maturity – 16% of all carcasses, 17% of beef cow carcasses, and 26% of beef bull carcasses were D maturity. In 1999 cow carcasses averaged E^{-} and bull carcasses averaged $D^{o.}$
- Overall maturity – 39% of all carcasses, 38% of beef cow carcasses, and 25% of beef bull carcasses were graded as D overall maturity.
- Quality grade – 44% of all carcasses graded utility. 29% of all carcasses and 33% of beef cows carcasses graded as cutters. 8% of all carcasses and 11% of beef cows carcasses graded as canners. .2% of the carcasses audited graded prime.
- Muscling scores - The majority of beef cow carcasses had a muscle score of 1 or 2, with an average for all cattle of 2.06. In 1999 cow carcasses averaged 1.6 and bulls averaged 3.5.
- Fat scores – More carcasses audited in 2007 had fat color scores of 1 and 2 (whiter color). The 2007 average score was 2.7. The average fat color score in 1999 was 3.8 for cow carcasses and 2.5 for bull carcasses.
- Yield grade – The average yield grade was 2.6 in this year's audit. Cow carcasses in the 1999 audit averaged a 2.4 yield grade.

Traceability Audits

Key points:

- Traceability audits – 2% of carcasses were selected randomly to determine whether the animal could be traced back to the ranch/farm.
- Plant information such as back tags, bangs tags, and owner information were used for this process. Auction barns, USDA offices, and actual owners were contacted to identify the point of origin for each animal.
- 64% of all cattle and 71% of beef cattle were traced back to their original owner. 19% of all cattle and 16% of beef cattle were traced back to the auction barn. 13% of all cattle and 11% of all beef cattle were traced back to the cattle dealer/trader. 5% of all cattle and 3% of all beef cattle could not be traced back past the packing plant.

Packing Plant Audit Interviews

Interviews were conducted with one packer and one Food Safety and Inspection Service employee at each packing plant. The interviews consisted of free response and aided questionnaires and were used to determine improvements and declines in the quality of cattle since the 1999 audit.

Packing plant and FSIS representatives interviewed acknowledged that the downer rule instituted by the United States Department of Agriculture's Food Safety and Inspection Service has led to several improvements in beef cattle quality.

Packing plant representatives noted a decrease in the number of downer, dead and moribund cattle, and fewer instances of inadequate space on trailers and incorrect loading of cattle.

FSIS representatives also noticed fewer downer, dead, and moribund cattle, and fewer instances of inadequate space on trailers. Their observations indicated fewer animals arriving suffering from advanced lameness and extreme emaciation.

Top seven quality challenges, 1999 versus 2007

1999	2007
Bruises	Food safety
Antibiotic residues	Animal welfare/handling
Birdshot/buckshot	Poor condition/nutrition
Arthritic joints	Antibiotic residues
Yield	Bruises
Condition/leanness	Hide damage
Condemnation rate	Lameness/soundness

Top 5 Beef Cattle improvements over 1999

Herd management techniques
Downers, animal welfare and handling
Hide damage
Injection-site location
Bruises

The content of this paper was adapted from the NCBA National Market Cow and Bull Beef Quality Audit Executive Summary written by Eric Grant and edited by J.D.W. Nicholson, D.S. Hale, and J.W. Savell.