Proceedings, Applied Reproductive Strategies in Beef Cattle
August 31 – September 1, 2011; Joplin, MO

USING THE "MISSOURI RECIPE" FOR HITTING THE QUALITY TARGET

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Introduction

As I reflect on the past 3-5 years, I am amazed at all that has happened. For 20-30 years, pre-2007, we sold calves at $0.95-$1.00/lb, feedlot cost of gain was $0.45-$0.60, fed cattle sold for $60-75/cwt and we thought a $1.00 swing in the calf or fed market was amazing. We even talked about cattle cycles – when did you last hear that mentioned? Today, we are seeing:

- Unprecedented cattle prices
- Unprecedented input cost
- Volatility of a magnitude never before experienced
- Global impacts of great influence

I would like to tell you all that is behind us and the future is bright and balmy for this great industry. Actually, I do see a bright future for this industry, especially for those willing to hit targets that the consumer will pay premiums for, but I do not see the volatility changing.

So what is the consumer telling us?

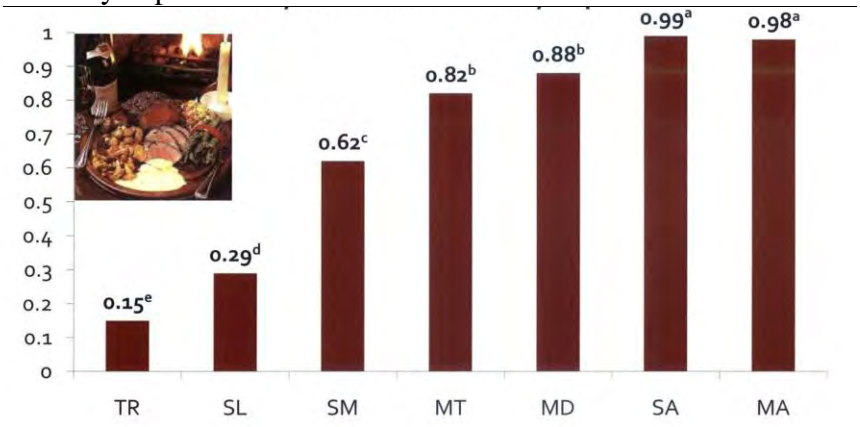
At virtually all income levels, consumers prefer beef as their animal protein. Many will pay more for a better quality product, but when they do they expect predictable flavor and tenderness. The consumer identifies quality with the USDA beef grading system.

Table 1. Eating satisfaction related to USDA quality grades.

Quality grade	Undesirable eating experience	% Undesirable
Prime	1 in 26	4
Premium Choice (CAB®)	1 in 19	5
Choice	1 in 7	14
Select	1 in 5	20

Always remember the ultimate driver of consumer satisfaction is tenderness and flavor, which explains 91% of the variation in eating quality (Emerson, et al 2011). Thus, as you would expect as marbling levels decline consumer satisfaction drops. A recent NCBA check-off funded project showed that exact trend.

Figure 1. Effect of marbling degree on probability of a positive sensory experience.



So where does this leave the producer? Producers today are at a crossroad trying to decide whether to stay commodity focused or brand focused. Successful (and there will be many) commodity producers will need to be low cost, efficient producers who may have to sell at slightly lower prices. Brand focused producers likely will receive more dollars, but possibly at some loss of flexibility in how they do things (Feuz, 2011).

Let us address four myths about quality (brand-focused) beef production.

Myth one – There is no extra money made by producing a higher quality animal. Ten years ago maybe that was true, but today, whether it is a sale barn sold calf or fed steer, quality signals or grid premiums clearly exist. To not over simplify it will take some marketing skill to make sure you get those dollars, but they clearly exist.

Table 2. Example of premiums paid by one national program used by many producers in this region.

	Added $/head as fed cattle
Top 25%	$80
Top 50%	$67

Myth two – You sacrifice growth and pounds to hit quality targets. Actually, you can have both as clearly shown in the following table. Always remember, high gaining cattle are healthy, well managed genetically superior animals.

Table 3. Effect of percentage Angus on feedlot performance and carcass traits in beef calves (Iowa Tri-County Steer Carcass Futurity Data).

	% Angus			
	Low	Half	Three quarters	Straight
Avg. Marbling Score	395.7	423.0	432.0	459.4
ADG, lbs./day	3.12	3.19	3.19	3.28
Health				
No. Times Treated	0.34	0.23	0.26	0.23
Individual Treatment Cost, $	7.72	5.54	6.72	5.6
Quality Grade				
% Prime	0.3	0.44	1.0	2.2
% Premium Choice	7.8	13.7	15.8	25.7
% Low Choice	43.4	52.5	53.3	54.1
% Select	43.1	31.3	28.1	17.3
% Standard	5.4	2.1	1.6	0.8
% CAB® Acceptance Rate	8.9	15.8	16.7	27.3

Myth three – High quality cattle do not feed as well. As previously shown, you can have both performance and quality. So not surprising is a recent analysis by Professional Cattle Consultants analyst Shawn Walter in which the results showed higher grading cattle are the most profitable.

Table 4. Characteristics of low, middle and high quality pens.

	Quality Grade Profile			
	Low	Middle	High	All Groups
Feedlot Placement Weight	729	731	724	728
Feedlot Finish Weight Live	1,276	1,291	1,305	1,290
Days on Feed	182	179	184	181
Pounds Gained in the Feedlot	532	547	571	550
Average Daily Gain	2.97	3.09	3.18	3.08
Average Carcass Weight	819	826	832	826
% Choice or Higher	33.3	51.9	72.8	52.6
% CAB® or Upper 2/3 Choice Premium	5.0	9.9	18.0	10.9
% YG 1 & 2	61.3	50.6	37.6	49.9
% YG 4 & 5	8.2	11.7	16.2	12.0
Calculated Profit/Loss	18.03	24.02	35.21	25.70

Myth four – You cannot have functional cows and still focus on quality. Dr. Twig Marston did an extensive literature search and created a "white paper" that said there is no relationship between functionality in the cow and how her progeny do on the rail (http://www.cabpartners.com/news/research/marston_marblingandothertraits.pdf).

So as an industry, are we making progress? The answer is both yes and no. The past years have been very positive as we have seen an upswing in quality grade with 68% now hitting the Choice or higher grade and a historical level (26-27%) hitting the Prime and Premium Choice targets.

Figure 2. U.S. Weekly % Choice & Prime.

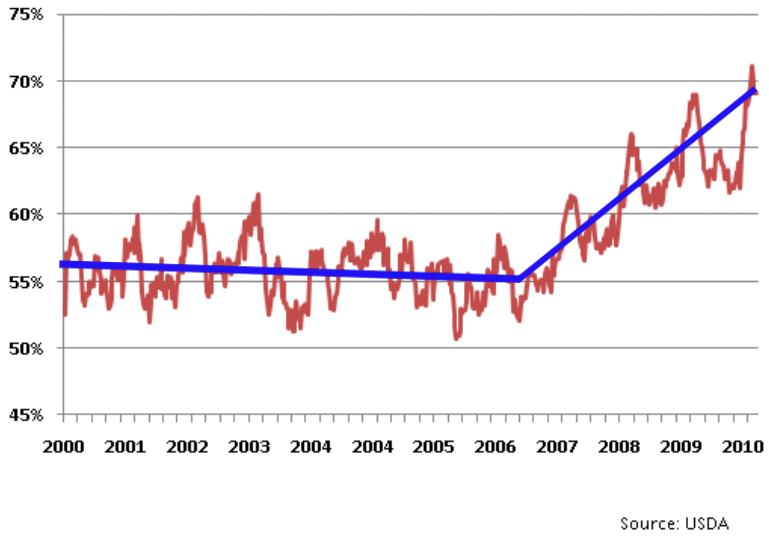
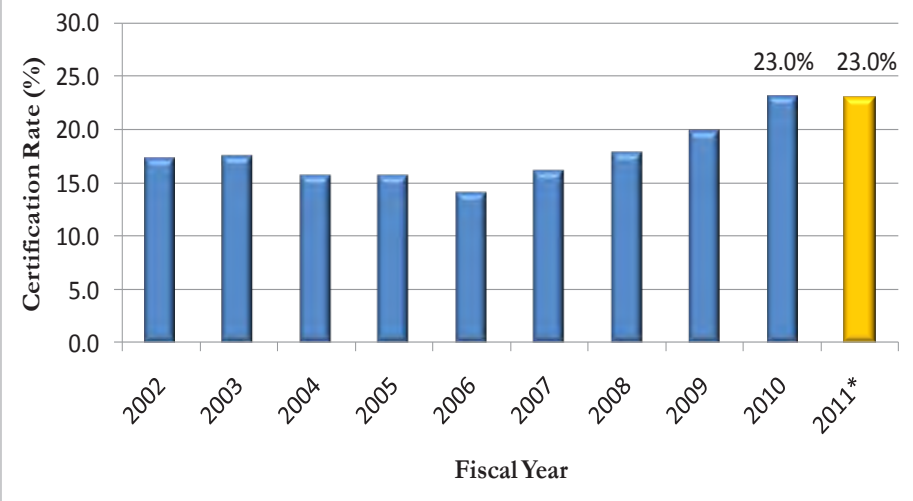


Figure 3. Percentage of Angus-influenced cattle certified.



* projected
Certified Angus Beef LLC's fiscal year is October to September

As good as that appears, previous speakers like Mike Kasten and other Missourians would say we can do much better. That is because Mike and others are using the "Missouri recipe" to achieve outstanding quality levels.

Table 5. Missouri data.

	CAB® acceptance rate
Today	22-24%
Realistic Goal	35-40%
Top Side (Missouri)	
MU Thompson Farm	86.0%
Osborn Farms/Pete Mitts	100%
Johnnie Hubach	85.0%
Mike Kasten	76.3%

Keys to making the "MISSOURI RECIPE" work

1. Genetics are very important.

   When trying to create a positive eating experience, while still generating a profit for the producer, the old adage "it is hard to make silk out of a sow's ear" really fits. Using the "right" genetics is really step one to hitting a quality target. Four key genetic factors should be considered.

   a. *Breed choice* – Yes, all cattle breeds can create a quality eating experience, but some breeds excel. The excellent research at the Meat Animal Research Center (MARC) in Nebraska has highlighted the variation in marbling potential by breed.

Table 6. Birth year 2009 average EPDs from 2011 evaluations for carcass and composition traits.

	Carcass							
Breed	Carcass Wt (lb)	Retail Product (%)	Yield Grade	Marbling Score	Ribeye Area (in^2)	Fat Thickness (in)	Rump Fat (in)	WBSF (lb)
Angus	15.0			0.43	0.21	0.012		
Hereford				0.04	0.22	0.002		
Murray Grey	27	0.3		0.0	0.09	0.00	-0.01	
Red Angus	35.5		-0.003	0.07	0.07	-0.034		
Shorthorn	4.9			-0.02	0.07	-0.01		
South Devon	25.0	0.8		0.3	0.21	0.01		
Beefmaster				0.00	0.03	0.000	0.00	
Braford	6			0.01	0.06	0.002		
Brahman	5.2	0.01		-0.01	0.04	-0.002		0.0
Brangus	0.7			0.04	0.37	0.00		
Santa Gertrudis	0.0			0.00	0.00	0.00		
Simbrah	-6.3		0.06	-0.01	-0.2	0.01		-0.03
Braunvieh	0.1			0.12	0.01	0.115		
Charolais	14.1			0.01	0.18	-0.001		
Chianina	-1.2	-0.20		0.09	0.02	0.01		
Gelbvieh	8.3			-0.03	0.10			
Limousin	19.4		-0.08	-0.04	0.49			
Maine-Anjou	-0.1	0.29		0.20	0.15	0.00		
Salers	20.0	0.0		0.1	0.03	0.00		
Simmental	-1.7		-0.001	0.15	0.10	0.15		-0.30

Because of the growing impact of Angus genetics, today 55-60% of all bulls turned out for breeding are Angus and 64-65% of all fed cattle are black-hided (i.e. partly linked to survey data showing over 75% of the U.S. cow herd is straight or predominately Angus).

Figure 4. Percentage of black cattle of total population.

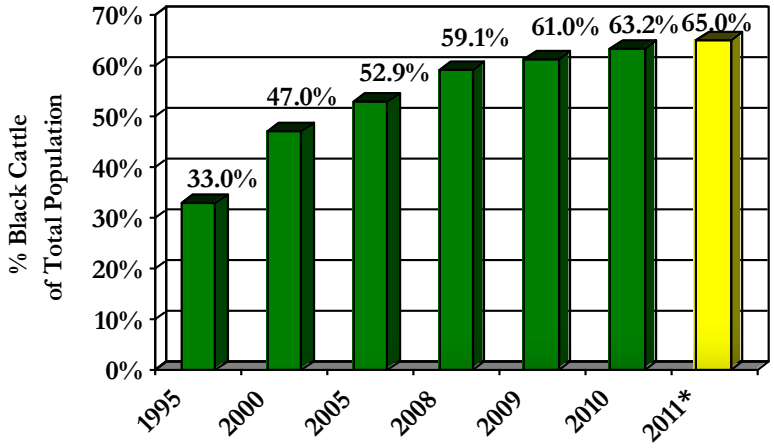


Table 7. Effect of hide color on feedlot performance and carcass traits in beef calves (Iowa Tri-County Steer Carcass Futurity Data).

	Black	Non-black
Avg. Marbling Score	434.8	400
ADG, lbs./day	3.21	3.08
Health		
No. Times Treated	0.26	0.33
Individual Treatment Cost, $	6.19	7.46
Quality Grade		
% Prime	1.17	0.4
% Premium Choice	17.2	7.36
% Low Choice	53.1	45.7
% Select	26.7	41.6
% Standard	1.85	4.9

As shown in the above table, black-hided calves out gain and out grade the non-black counterparts, which leads to black-hided calves topping the market at all phases of beef production.

b. *The Angus genetic influence* – Angus as a breed, from its origin in Scotland as the "butcher's breed," has created the image where the name Angus and eating quality are synonymous. The name Angus is present in 67-68% of all USDA beef brands. Hence, it is not surprising as the percentage of Angus in a calf increases, quality grade improves and CAB® acceptance rates grow, explaining why today 40-50% of all calves result from a straight commercial Angus cow mated to a registered Angus bull.

Table 8. Effect of percentage Angus on feedlot performance and carcass traits in beef calves (Iowa Tri-County Steer Carcass Futurity Data).

	% Angus			
	Low	Half	Three quarters	Straight
Avg. Marbling Score	395.7	423.0	432.0	459.4
ADG, lbs./day	3.12	3.19	3.19	3.28
Health				
No. Times Treated	0.34	0.23	0.26	0.23
Individual Treatment Cost, $	7.72	5.54	6.72	5.6
Quality Grade				
% Prime	0.3	0.44	1.0	2.2
% Premium Choice	7.8	13.7	15.8	25.7
% Low Choice	43.4	52.5	53.3	54.1
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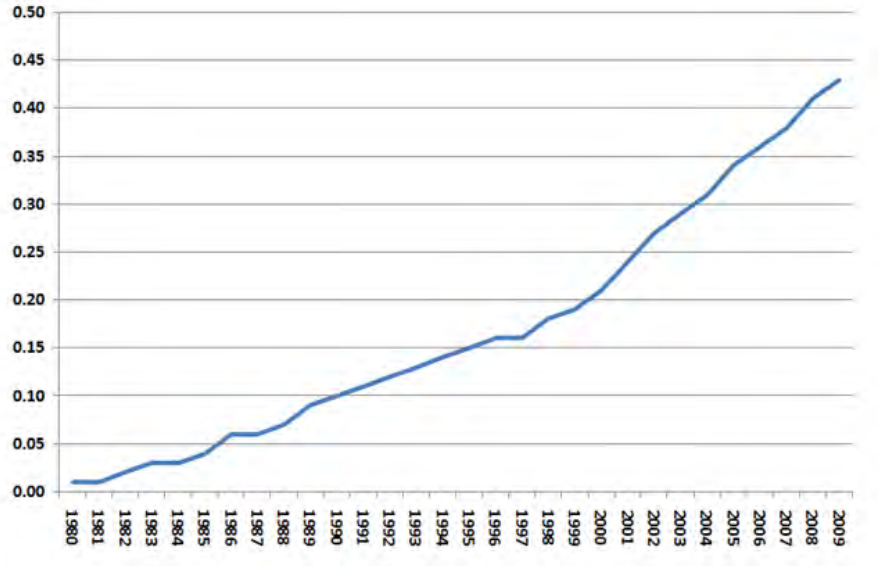
% Standard	5.4	2.1	1.6	0.8
% CAB® Acceptance Rate	8.9	15.8	16.7	27.3

c. *Successful use of genetic information like marbling EPDs and genetic indexes like $B* – Although Angus as a breed marbles very well, there is a huge variation among bulls. A great way to incorporate those top bulls is use of marbling EPD information. As a breed, Angus breeders have made great progress in focusing on marbling as part of their selection process.

Figure 5. Angus genetic trend for marbling (Spring 2011) – average marbling EPD by birth year.



Older data collected at Oklahoma State University, supports how much variation does exist, so take time to know how to use EPD information. Today, through the use of DNA, many breeders are able to further enhance the accuracy of the genetic information. This will continue to get better in the future.

Table 9. Oklahoma State University data.

Grade	Top 10%	Bottom 10%
% Prime	5.0	1.0
% CAB®	45.6	13.3
% Low Choice	38.3	39.7
% Select	10.4	36.9
% Standard	0.6	8.9
Yield Grade	2.8	3.34
Carcass Weight, lbs.	750.3	650

d. *Through AI usage, the ability to use proven genetics* – In the "Missouri recipe," one of the key success factors has been their effective use of artificial insemination. This allows use of proven genetics, but also bulls with high marbling EPDs. The following figure graphically illustrates the value of proven genetics.

Table 10. Performance data (2008-2010) for steers from the University of Missouri Thompson Farm, Spickard, MO, that were fed at the Irsik & Doll Feed Yard in Garden City, KS.

Sire Group	**Maternal Grand Sire**	**No of Steers**	**% Choice or Higher**	**% CAB® and Prime**
High accuracy	High accuracy	118	100%	84%
High accuracy	Low accuracy	53	100%	94%
High accuracy	Natural service	27	100%	74%
Totals		198	100%	86%
Natural service	High accuracy	39	94%	69%
Natural service	Low accuracy	12	100%	67%
Natural service	Natural service	23	96%	35%
Totals		74	96%	58%

The initial female mating is important. When daughters of proven high accuracy bulls are mated back to unrelated proven high accuracy bulls, the ultimate success can be achieved. These progeny become cattle with $100 premium potential in a grid marketing program, as shown in the Mike Kasten data below.

Table 11. Stacking Marbling – University of Missouri study.

	Generations			
	Start	1	2	3
% Prime	0	8	31	53
% CAB®	25	52	56	47
% Low Choice	31	36	13	-
% Select	43	4	-	-
Avg. premium, $	20.21	40.63	52.86	82.30

2. Managing cattle for a quality target.

   As important as genetics is to hitting a quality target, management is equally important. Every day quality is managed out of cattle by poor decisions. Let us examine four key factors:

   a. *Health management* – Herd health is critical to a profitable ranching operation, and no less important in producing a high-quality beef product. The best genetics are easily derailed if cattle get sick at any time in their lives. Research has repeatedly shown the dramatic impact health has on both feedlot performance and carcass merit.

      These recommendations are meant as a general guide, but cannot anticipate regional or individual herd health needs. Your local veterinarian should always be consulted when developing your health programs.

      Whole-herd health
      Herd vaccination strategies are designed to reduce the risk of disease from common reproductive, respiratory and enteric pathogens. Vaccination will not eliminate disease risk, but, when accompanied by good animal husbandry and biosecurity, it can greatly reduce risk and losses from disease.
      Develop a herd health vaccination program that includes:
      - IBR
      - PI-3
      - BVD
      - BRSV
      - Vibriosis
      - Leptospirosis

Calving time
The first critical point for calf health is birth, after which colostrum (first milk) prepares the immune system to ward off health challenges.

- Select to minimize calving difficulties, especially in virgin heifers. Difficult births stress both dam and calf and may reduce the amount and timeliness of nursing. Calves need colostrum within the first 12 hours to maximize antibody absorption.
- Calving ease is largely determined by birth weight and can be accurately managed using Birth Weight (BW) and Direct Calving Ease (CE) EPDs.
- Tag and record identity and sex of calves.
- Consider castration of male calves.

Scour prevention
One of the first health challenges for a calf could be scours.

- Research has development management systems to minimize the threat by rotating to fresh pastures while calving.
- Some managers may choose to vaccinate cows prior to calving, especially in corral and drylot environments, to provide disease protection through colostrum. If the cowherd has not been vaccinated, an oral vaccine in newborns prior to nursing can provide immediate protection in the gut. A scours vaccination program should include protection against:
    - Rotavirus, coronavirus
    - K99 E. coli
    - Cl. perfringens Type C

60 to 90 days of age
A proper vaccination program allows the calf to enter into the stress of weaning with a prepared immune system.

- Use a vaccination program that includes protection from IBR, PI-3, BVD, BRSV and clostridial disease. Vaccine labels vary for administration to nursing calves, so work with your veterinarian to develop a program that fits your operation.
- If calves will be weaned within 30 days, consider de-worming and applying controls for internal and external parasites specific to your region. Calves treated now will be parasite free at weaning.
- If not done earlier, castrate male calves to minimize stress.

Implant use
Growth-promoting implants administered at or before weaning may reduce marbling levels at harvest. To maximize a calf's marbling potential, or if you are retaining ownership, implants at the suckling or backgrounding stages should be avoided. For calves on first- and second-calf heifers, or cows with reduced milk production due to limited forage, implants can be especially negative to marbling. If you are using implants, both timing and potency need to be considered.

b. *Nutritional management*

Whole-herd nutrition

Herd nutrition, including your protein, energy and mineral programs, has a significant impact on the health and immune response of your calf crop, which can affect carcass-quality potential.

- Work with your nutritionist to develop an effective nutritional program.

Pre-weaning and weaning

As early as 60 days of age, nutrition other than milk has been shown to affect carcass quality. Supplemental feed while still nursing can have a significant positive effect on marbling. Diets high in starch (especially corn) have been proven a most effective way to stimulate marbling deposition.

- If a calf's growth potential is being held back by nutrition, marbling is being sacrificed. Calf gains below 2 lb. per day should be avoided.

Creep feeding and early weaning

Creep feeding and early weaning can improve marbling and aid transition to independent life at weaning. One of these two strategies, sometimes both, can benefit your operation. The decision depends upon your facilities, management and marketing goals. Retained ownership may improve return on investment. Both strategies bring additional benefits in the face of drought or reduced forage by improving reproductive performance and stocking rates. Both choices are also valid options for calves nursing first-calf heifers or cows with limited milk production.

- Utilize a corn-based, high-starch ration with an ionophore. Because of starch removal in the distilling process, distiller's grains are not recommended as the primary component of a creep diet.

Post-weaning and preconditioning

- 45-day minimum preconditioning period.
- Target gains from 2 to 2.5 lb. per day.
- Get calves eating from a bunk and drinking from a waterer.
- Utilize a corn-based diet. Because of starch removal, distiller's grains are not recommended as the major component of the diet.

Caution

If calves are moved from a high-energy diet to a lower gain (<2.0 lb./day) growing diet, they will not continue to develop marbling at a high rate.

c. *Weaning management* – Stress compromises immune system function. Thus, every effort should be made to reduce stress at weaning time. Various management strategies, such as fence-line weaning, have been shown to minimize stress.
    - All booster vaccinations should be given at weaning time. Do not booster clostridials at weaning if done previously.
    - If not done at pre-weaning, de-worm and apply controls for internal and external parasites specific to your region.
    - If pre-weaning vaccinations were not administered, give first round of vaccinations. Follow these with a booster 14 to 28 days later.
    - A medicated starting ration may be used for at least 60 days to reduce sickness and digestive problems (bloat). Rations with an ionophore and coccidiostat are recommended.
    - Calves should go through a minimum 45-day preconditioning program before shipping. This gets them through the stress of weaning, accustomed to eating from a bunk and drinking from a waterer.

Table 12. Health program timing recommendations.

	Basic practices	Better practices	Best practices
Calving	Ensure colostrums intake Tag, record identity & sex Scour prevention	Ensure colostrums intake Tag, record identity & sex Sour prevention	Ensure colostrums intake Tag, record identity & sex Scour prevention
60-90 days			**1st round**-IBR/PI-3/BVD/ BRSV **1st round**-Clostridials
4-6 weeks pre-weaning		**1st round**-IBR/PI-3/BVD/ BRSV **1st round**-Clostridials	**2nd round**-IBR/PI-3/BVD/ BRSV **Booster**-Clostridials **De-worm**
At weaning	**1st round**-IBR/PI-3/BVD/ BRSV **1st round**-Clostridials	**Booster**-IBR/PI-3/BVD/ BRSV **Booster**-Clostridials **De-worm**	**Booster**-IBR/PI-3/BVD/ BRSV
14-28 days post-weaning	**Booster**-IBR/PI-3/BVD/ BRSV **Booster**-Clostridials		

If not early weaned, match weaning time to the calf's growth potential. The industry standard of 205 days may be late for today's higher growth genetics, as milk without supplementation may not be meeting the calf's energy requirements.

- Consider weaning calves when they have reached approximately 45% of their expected finish weight. Thus, a steer that finishes at 1,300 lb. should be weaned by 585 lb.

d. *Reproductive management* – We all know that early calving cows (heifers) are the most economically efficient because they wean heavier calves and breed back sooner and at higher levels. What we did not know until recently is early born calves result in the production of higher quality carcasses. As first reported by Dr. Rick Funston, University of Nebraska beef scientist, this was supported by our data collected on a Missouri cattle operation.

Table 13. Quality grade by birth sequence within the spring calving season.

	Birth Sequence				
USDA Quality Grade	E	ME	ML	L	Chi-Square P Value
Prime	0.53%	0.78%	0.00%	0.11%	0.3915
CAB®	28.60%	24.37%	16.28%	11.24%	<.0001
All Choice	85.05%	83.63%	76.88%	77.89%	0.0087
Select	13.88%	14.81%	23.12%	21.05%	0.0043
Standard	0.53%	0.78%	0.00%	1.05%	0.9695

3. Marketing philosophy – Marketing is the payoff for adding value. Traditional methods typically pay on averages, discounting the best cattle to subsidize the poor ones. If you have made an investment in time, resources and risk, your next steps must be marketing in a w ay that generates a return on those investments.

Document value

The first step is documenting the value in your calves. Then, play an active role in promoting that value, regardless of the marketing venue. Here's a short list of the primary value factors to record:

- Weight
- Location and proximity of feedlot
- Health program – vaccine companies and veterinarians offer systems to validate your program. These give assurances to buyers and add value to your calves.
- Genetics – breed profile of cows; breed and EPD profile of sires.
- Age range – oldest to youngest calf in the group. With requirements for export markets often determined by age, this record adds value to your calves, especially if done through a USDA Quality Systems Assessment (QSA) or Process Verified Program (PVP).

The AngusSource® program is a USDA PVP that can help qualifying herds document and supplement marketing efforts. Calves sired by registered and transferred Angus bulls can be enrolled into this American Angus Association® program that documents age, source and genetics. The AngusSource® program can also list your calves to buyers around the country. To learn more, go to www.angussource.com or call 816-383-5100.

You want to capture all or most of the value you add to your calves. The amount you can capture through marketing depends on the risk you are willing to stand and amount of

ownership you are willing to retain. Retained ownership through finishing may not be best for producers of unknown genetics or those who take no steps to coordinate health and weaning. However, it may be the best way to realize the full feeding and carcass value of a set of cattle. The following marketing scenarios are ranked based upon their ability to capture value.

Option 1 – Full- or partial-retained ownership (plus grid marketing)

- Retain up to 100% ownership in the calves through finishing and sell the cattle on a value-based marketing grid or formula. Many feedlots will partner with you on a set of calves with varying levels of ownership from 75% or more to less than 25%. Many also offer up to full-term financing for the feedlot phase, using the cattle as equity.
- Select a feeding partner. That's not as daunting as it once was. Certified Angus Beef LLC (CAB) has taken the first step in identifying feedlots that have demonstrated an ability to feed cattle for the brand. CAB® Feedlot Licensing Program (FLP) partner yards are great candidates for starting your search. Access the list of FLP yards at www.CABpartners.com/feedlots.
- Conduct several phone conversations to narrow the list, then personal visits to find a feedlot partner matching your goals.
- Finally, pick a feeding partner with whom you are comfortable. Get to know the management personnel and their philosophies. Success in feeding your cattle will be highly dependent on your comfort, trust and communication with each other.
- Note: Some of the calves from your herd may not be ideal for feeding with the group. Those born far earlier or later than average may present feeding challenges. Sort those very heavy or light ones out, along with any outliers for health (chronics) or genetics (neighbor's bull), and market them as feeders. The older and younger cattle may still bring a premium from a buyer with orders to fill. Outliers may take a discount, but that would likely be amplified if you try to feed them with the rest of your calves.

Option 2 – Direct feeder sale with opportunities for later premium sharing

This relatively new concept is already offered by several progressive feedlots. Cow-calf producers sell their calves to the feedlot at a high percentage of an agreed upon price, with a provision for obtaining bonuses based upon the cattle's health, performance and carcass merit. These bonuses would be paid to the cow-calf producer after the fed cattle are marketed.

CAB has developed a feeder calf value-discovery pricing system that may be used as a model for innovative partnering options. Feedlots offering such deals will probably include bonuses for those general areas of health, performance and grade. However, the exact bonuses and complexity of the arrangement will vary among feedlots.

Option 3 – Special feeder calf sales

Many state, regional and county livestock organizations and universities hold special sales in cooperation with auction market operators or video/internet auction services. These sales aim to assemble truckload lots (~50,000 lb.) of calves of like weight, sex, health and genetics, often in multiple-owner, co-mingled lots.

- Investigate the options and consider using a sale that works for your scenario. Each sale has some unique requirements for participation.
- Enlist the assistance of your seedstock provider and visit with your local auction markets about their willingness to hold the event if a sale is not organized that fits your needs.
- Consider working with other producers who have similar goals and organizing your own event. If you do not have enough for an entire sale, try to get a section of an existing sale devoted to your group.
- Promote your participation in any sale to prospective feedlots and order buyers.
- Investigate any means of tracking calves after the sale. The AngusSource® program can certainly help with promotion, and it may help facilitate future transfer of information back to the ranch.

Summary

Adding value beyond just pounds is a challenge, but improving quality grade sure can help achieve that goal allowing producers to take great pride in what they are achieving.

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