So You Want to Be a Rancher?

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From time to time, people with little or no ranching background decide to invest in land and begin producing livestock. Unfortunately, many pitfalls exist and much time, money, and effort can be wasted while learning basic lessons about the soil-plant-animal interface, nutrition, genetics, and health maintenance of livestock. This publication acquaints ranching newcomers to important components of livestock production and management so that informed decisions can be made. The topics are relevant to producers who hope to earn a profit as well as those who view the ranch as a hobby.

Business Planning Basics

Few people leave home on a trip to an unfamiliar destination without a road map. They want to know where food, gas, and lodging might be available and when they will arrive at their destination. Why should you do less when considering a major investment? Do you have a well-developed "road map" for the ranch business? What are your goals? What limitations do you face?

Business planning helps the beginning rancher evaluate the feasibility of a proposed venture and may uncover previously unconsidered opportunities or limitations. It helps ensure that investors make decisions based on realistic data, not just emotions. In addition, the business plan is an important reference for individuals seeking financing. The Cooperative Extension Service, Small Business Administration, and small business centers can provide general information on business planning as well as guidance on legal requirements such as permits, taxes, licenses, and other issues related to business operations.

The business plan should include the following components, at a minimum:

- Mission or vision statement and goals
- Key planning assumptions
- Operations, organization, and management
- Financial plan
- Market analysis and marketing plan (more in another section)

You may be thinking, "But I just want to own a few cows." If you are using savings to finance the project, completing a business plan will help ensure that you make the investment with your eyes wide open. You may find that there are better uses of your time and money. Better to discover that sooner rather than later.

Mission and Goals

Developing a mission statement and setting goals helps identify why the business will exist and what it will achieve (even if it is primarily to serve as a hobby). Goals can be tangible and intangible, short run and long run, monetary and non-monetary. Because achieving goals often requires the cooperation of family, goal setting should involve discussion and compromise among family members. Try to anticipate problems and plan strategies for overcoming them. Don't ignore potential conflicts or restrictions that might prevent you from reaching your goals. Identifying possible problems in the planning stage will allow you time to either resolve conflicts or channel your efforts to feasible objectives. Be reasonable in setting goals, use the best information available, and include all decision-makers in the process.[2]

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[1] Authors are OSU Extension Economist, former OSU Beef Cattle Breeding Specialist, Texas A&M Area Forage Specialist, OSU Veterinarian, OSU Veterinarian, OSU Reproduction Specialist, OSU Tax Specialist, OSU Livestock Marketing Specialist, OSU Beef Cattle Specialist, and Langston University Agricultural Marketing Specialist respectively.

[2] See OSU Bulletin E-887, "Goal Setting for Farm/Ranch Families," for additional information.

Key Planning Assumptions

List the family and ranch resources—land, labor, financial capital, other capital assets, and management—available for the ranch. Identify planning restrictions and constraints, if any. Determine your expected product and where you plan to market it.

Operations, Organization, and Management

If more than one person will be contributing labor, management, or other resources, it is important to define the roles of each individual in the business. If the ranch will be a large operation, an organizational chart should be developed to indicate the decision-makers and list the duties and responsibilities for personnel. In addition, identify the most appropriate legal arrangement: sole proprietorship, partnership, corporation, etc. Develop plans for compensation and allocation of profits.

The Financial Plan

The financial plan should include initial financial requirements, historical and projected financial statements, risk assessment, and break-even analysis. To complete it, you must have some well-formulated ideas about the goals, assumptions, operations, and expected markets. The decision to produce beef is often a lifestyle choice, rather than an economic one. Investing in a ranch is an expensive undertaking and can be financially stressful, particularly during cyclical low returns to the industry. Land ownership in particular is costly. Historical rates of returns to agricultural assets average four to five percent; therefore, it can be difficult to make principal and interest payments on land notes with income generated only from the farm or ranch. Table 1 summarizes expected costs of purchasing assets to establish a 50 cowherd, assuming no improvements such as fences, roads, or watering facilities must be added. If land and a minimum set of machinery and equipment are purchased, the investment approaches $6,000 per cow. If land is rented rather than purchased, the investment is reduced to $1,330 per cow; however, the annual operating costs would increase to include pasture rental costs. Note that this investment plan does not include any hay equipment since that equipment is financially feasible only for large-scale hay producers or producers doing custom work.

Table 1. Ranch Investment Cost Summary

Land		
Pasture	450 acres @ $400 per acre	$180,000
Cropland	50 acres @ $1,000 per acre	50,000
Barn		2,500
Pickup	(1/2 of $25,000 vehicle for ranch use)	12,500
Trailer		5,000
Livestock equipment		2,500
Feeding equipment		3,000
Breeding cows	50 head @ $720 per head	36,000
Herd bulls	2 head @ $2,500 per head	5,000
Total investment		**$296,500**

The enterprise budget shown in Table 2 lists anticipated operating inputs, fixed costs (interest, depreciation, taxes, and insurance) on machinery, equipment, and livestock, and the expected production per cow. The return above all costs in this example is negative indicating that insufficient income is generated to cover all fixed costs. If the owner is willing to provide his or her own labor for the enterprise and earn less than $6.50 per hour for the contribution, the returns could be slightly higher. However, even if the operator provides all labor at zero cost to the enterprise, the operation is not expected to earn a profit given other assumptions. This budget points out the hard realities faced by many livestock producers and the need for supplemental income if production or income generated is below average.

Table 2. Example Enterprise Budget.
Cow-calf, spring calving, warm season pasture.
Cost/return per cow, ranch size unit.
Winter dry matter is 25% non legume hay.

OPERATING INPUTS	*Units*	*Price*	*Quantity*	*Value*	*Your Value*
Non-legume hay	lbs.	0.03	964	24.10	
41-45% protein supplement	lbs.	0.13	299	38.87	
19-20% protein feed	lbs.	0.08	367	29.36	
Salt and minerals	lbs.	0.08	30	2.40	
Summer pasture	AUMs	8.43	8	67.52	
Winter dry pasture	AUMs	8.43	3.53	29.76	
Vet service	hd.	2.80	1	2.80	
Vet & med. supplies	hd.	14.65	1	14.65	
Marketing expense	cwt.	1.75	4.32	7.56	
Personal taxes	hd.	5.30	1	5.30	
Herd bulls	cwt.	85.00	0.12	10.31	
Hauling	cwt.	0.35	4.32	1.51	
Annual operating capital	dollars	0.09	139.18	12.18	
Machinery labor	hours	6.50	4.46	29.02	
Equipment labor	hours	6.50	0.04	0.27	
Livestock labor	hours	6.50	5.29	34.39	
Machinery fuel, lube, repairs	dollars			32.06	
Equipment fuel, lube, repairs	dollars			1.18	
TOTAL OPERATING COSTS				343.24	

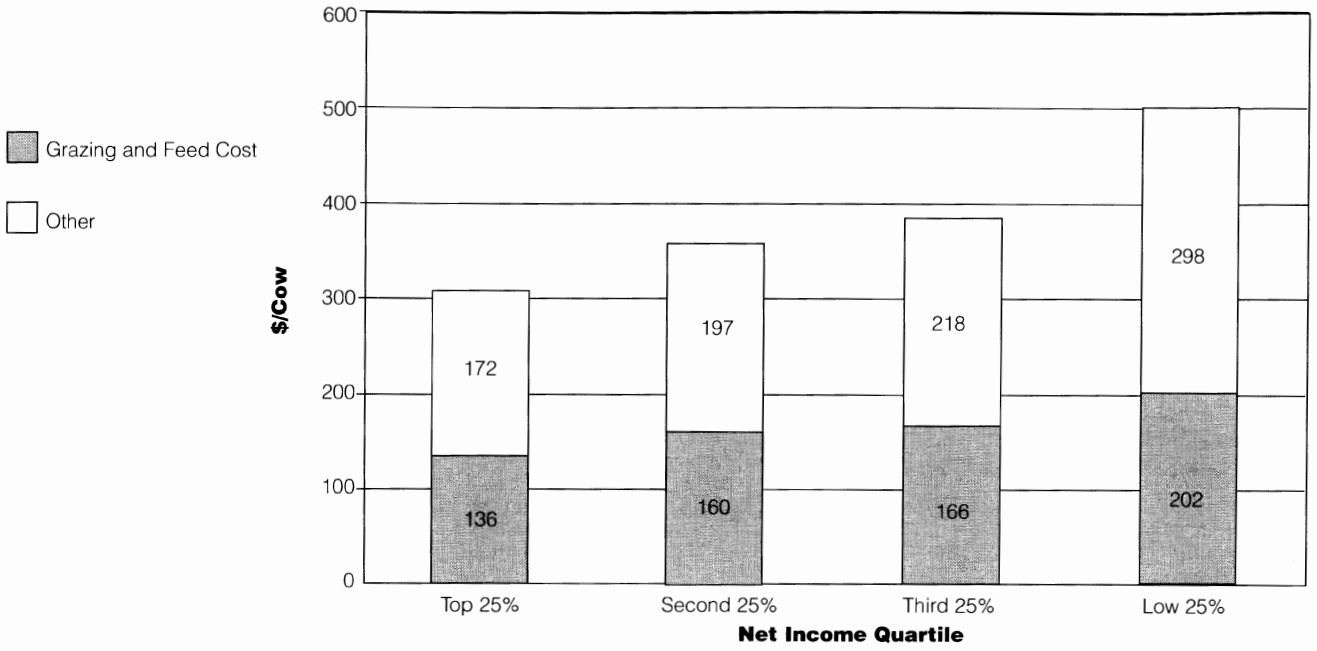
FIXED COSTS		*Amount*	*Value*		*Your Value*
Machinery					
Interest at	9.1%	53.45	4.86		
Depreciation, taxes, insurance			10.46		
Equipment					
Interest at	9.1%	13.43	1.22		
Depreciation, taxes, insurance			2.59		
Livestock					
Beef cow		720.00			
Bull		49.95			
Heifer		60.00			
Interest at	9.1%	829.95	75.52		
TOTAL FIXED COSTS				94.65	

PRODUCTION	*Units*	*Price*	*Quantity*	*Value*	*Your Value*
Steer calves (4-5)	cwt.	94.00	1.92	180.74	
Heifer calves (4-5)	cwt.	79.00	1.27	100.01	
Commercial cows	cwt.	42.00	0.87	36.67	
Aged bulls	cwt.	49.00	0.14	6.65	
Heifers (6-7)	cwt.	74.00	0.12	8.95	
TOTAL RECEIPTS				333.03	

RETURNS ABOVE TOTAL OPERATING COST	-10.21	
RETURNS ABOVE ALL SPECIFIED COSTS	-104.86	

88% calf crop at 210 days. 1000# mature cows.
2% cow death loss excluded in cull cow sales.
3% shrink on cattle.

Figure 1. Standardized Performance Analysis (SPA) Financial Costs by Net Income Quartile



One source of information about returns to cow-calf enterprises is the national Standardized Performance Analysis[3] (SPA) database. Individual producers have been submitting their SPA results to the database since 1992. Comparisons of average financial statistics in dollars per cow and dollars per hundredweight of weaned calves for low and high cost producers in Oklahoma, Texas, and New Mexico are summarized in Figure 1 and Table 3. Findings from analysis of the database include:

- The average cost of producing a weaned calf is $1.55 per pound (more often referred to in livestock circles as $55 per hundredweight, abbreviated cwt) for low cost producers and $1.23 per pound ($123 per cwt) for high cost producers.
- Low cost producers generally have much less investment in machinery and equipment.
- High cost producers have higher debt levels per cow than low cost producers.
- Feed and grazing costs are a significant proportion of total cost of production.
- Costs of production are highest on average for herds with less than 50 cows, lowest for herds with more than 1000 cows.
- Average weaning weight and profitability are not correlated.

The rate of return on assets on a cost basis for low cost producers is comparable to returns that might be earned in an off-farm investment such as a stock market index fund. The break-even cost ($/cwt.) figures indicate that, even with relatively low calf prices, low cost producers are positioned to make (or lose very little) money. On the other hand, high cost producers clearly will need to draw on other income sources to support the cow-calf enterprise even when cattle prices are high.

The business plan serves as a road map for the ranch. Development of a realistic and complete plan helps ensure that investors make informed decisions and that unpleasant surprises are minimized. If outside financing is required the busi-

[3] Cow/calf Standardized Performance Analysis (SPA) software was developed by producers, Extension staff, and National Cattlemen's Beef Association Integrated Resource Management Committees to analyze production and financial performance jointly. The most important use of SPA is in monitoring key statistics over time like cost per breeding cow and pounds weaned per exposed female. See OSU Facts 222, "Integrated Resource Management Tools: Cow/Calf Standardized Performance Analysis (SPA) Software," for more information.

Table 3. Southwest Cow-calf SPA Summary Statistics[1]

	Quartiles (Based on Net Income)				
	Top 25%	*Second 25%*	*Third 25%*	*Low 25%*	*Average*
Production Measures					
Weaning Percentage	85	85	81	82	83
Average Weaning Weight	539	528	523	500	522
Pounds Weaned per Exposed Female	456	442	426	413	434
Financial Measures[2]					
Capital Investment per Breeding Cow	$3,452	$3,800	$2,648	$3,720	$3,410
Percent Return on Assets - Market Value	7.6%	2.5%	-0.4%	-5.3%	1.1%
Grazing and Feed Cost per Cow	$136	$160	$166	$202	$166
Total Cost of Production per Cow	308	357	384	500	387
Total Cost of Production per Cwt.	55	71	86	123	84
Net Income per Cow	140	38	-30	-181	-8

[1] Data are from 291 herds in Texas, Oklahoma, and New Mexico with 162,217 cows.
[2] Measures are calculated on a pretax basis.

ness plan will go a long way in helping secure the funds needed.

Evaluating Land Resources

Selecting a tract of land for livestock production should involve more than simply aesthetics. Unless you plan to market the beauty of the property by allowing access for camping, hiking, bird watching, etc., pay careful attention to the production capability and, thus, livestock carrying capacity of the property. Most real estate agents and potential buyers do not understand the important role that precipitation, in conjunction with soil texture and soil depth, play in the land's ability to produce forage or a profit in livestock production.

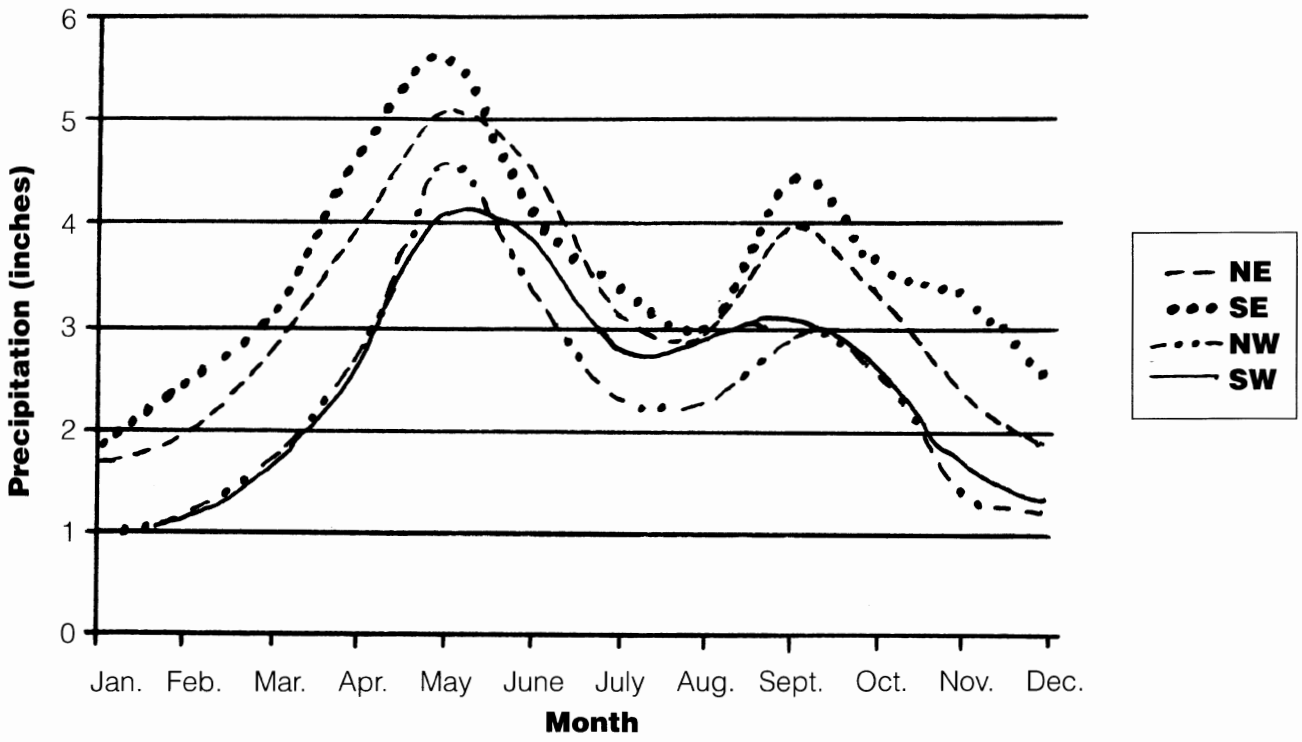
To realize maximum net return, livestock operations should depend mostly on forage production to meet livestock nutritional needs. The existing forage base can also affect the enterprise's profitability. In many cases, livestock producers use too much hay or supplements or both to offset a forage deficiency caused by overstocking. This is due to a lack of understanding about the role that different forages may play, or simply due to tradition. Multiple forage species can provide most, if not all, nutritional requirements for grazing livestock. As more forage is utilized relative to hay or purchased supplements, winter feeding costs are reduced and net return is increased, if other production costs are equal. Therefore, when the decision is made to purchase land for livestock production, careful consideration should be given to the key elements of forage production: precipitation, soil, and the existing forage base.

Precipitation

Moisture is generally the most limiting factor to plant production. For example, assume that a potential land purchaser is considering two tracts of land in different regions of the state. The tract that receives more precipitation could result in a more profitable operation simply due to increased forage production associated with higher precipitation levels. Precipitation levels vary dramatically throughout Oklahoma (Figure 2).

Actual precipitation received, however, does not tell the whole story. Soil texture and depth play major roles in determining forage production. It is quite possible for a site to receive less precipitation, but

Figure 2. Oklahoma long-term monthly precipitation (inches)



produce more forage due to good soil texture and soil depth when compared with a wetter site that has poor soil characteristics.

Soil Texture

Soil texture refers to the relative proportion of sand, silt, and clay in the soil. Texture is a major factor in determining the soil's water retention. Even if a site receives relatively high levels of precipitation, if the soil texture is such that the soil does not hold adequate water or allow moisture to infiltrate it, forage production can be reduced. Thus, producers should be aware of the land's soil texture prior to purchase. Fine-textured soils that contain high percentages of clay and silt hold more water than coarse-textured soils such as sands. Fine-textured soils are generally higher in fertility than coarse-textured soils (Table 4). From the standpoint of forage production, medium-textured soils such as loams, sandy loams, or silt loams are generally better choices. Contact the local USDA Natural Resource Conservation office for information about soil characteristics of a specific site.

Table 4. Soil productivity rating as affected by texture

	Surface Soil Texture				
Subsoil Texture	*Sand*	*Sandy Loam*	*Loam*	*Clay Loam*	*Clay, Silty Clay*
Sandy	50	55	65	60	55
Sandy Loam	60	70	80	75	65
Loam	70	80	95	90	75
Clay Loam	70	80	90	90	75
Clay and Silty Clay	65	70	80	80	70

Soil Depth

Soil depth interacts with both precipitation and soil texture to determine forage production capability. Many sites that otherwise have excellent potential for forage production do not produce well because of reduced soil depth. Shallow soils may be either naturally occurring or a result of past mismanagement and erosion of the topsoil. In either case, shallow soils have less water-holding capacity than deeper soils (Table 5). This, in turn, reduces the ability of the site to produce forage and reduces the site's livestock carrying capacity.

Existing Forage Base

To the untrained eye, many pastures appear similar. There can be, however, great differences in the existing forage base and the ability to stock livestock. For sites with native pasture, producers should determine if the site is, indeed, native or simply "go-back" land that was once cropped. This can make a tremendous difference in the management strategies that should be employed. Producers should also identify key forage species to determine if the site has been overgrazed. If the land has introduced forages, the producer should be aware of the species present and whether they will help achieve the overall goals of the ranch.

The land buying decision—assuming that profitability of the ranching operation is an objective—should be based on analyses of the fixed investment cost per animal unit and projected annual cost and return per cow. A profitable cattle operation can develop on poor soils if land with good soils is disproportionately expensive. However, poor soils with poor forage production may increase compensatory expenses.

Table 5. Soil productivity rating as affected by depth

Soil Depth Usable by Crop Roots (feet)	*Relative Productivity (%)*
1	35
2	60
3	75
4	85
5	95
6	100

Information concerning soils can be obtained free from local Natural Resource Conservation Service (NRCS) offices. Oklahoma has a Standard Soil Survey for all 77 counties that offers detailed information regarding precipitation, soil texture, soil depth, and the suitability of sites in the county for forage production, wildlife production, crop production, etc. Local NRCS and county extension personnel can provide further advice on the inherent forage production capabilities of land that you may wish to purchase. They can also help determine which forage species may be best suited for the local environmental conditions.

Planning the Livestock Investment

The first consideration in getting started in the cattle business must be the timing of the initial investment. For many years the cattle industry has been characterized by pronounced cycles of prices, production, and profitability. The various production sectors—cow-calf, stocker, and feedlot—are all subject to different cycles of profitability and often one or more sectors will be losing money while the others enjoy prosperity.

It is imperative for a new producer to understand cattle cycles and to know the industry's approximate position within the current cycle. Depending on the current stage of the cycle, a three to five year plan may be required for entry into the business, especially in cow-calf management. The business plan may suggest the need to delay cow purchases for several years and focus on other enterprises or delay the initial investment in land. The plan may consider other strategies for entering the business, for example, starting with heifers and growing into the business more slowly.

Seedstock or Commercial Producer?

Before purchasing the first animal for the new ranching endeavor, the producer must choose the appropriate segment of the industry to pursue. Two primary avenues include commercial production

(cow-calf or stocker) and seedstock development.[4] Analysis of the land resource, time and labor intensity, cattle prices, and stage in the cattle price cycle are just a few factors that may influence the choice of beef (stocker versus cow-calf) enterprise. At different times, some producers raise cows or stockers, or a combination of the two. Here, we focus on cow-calf production, although many parts of the discussion are appropriate for potential stocker operators. Both commercial and seedstock cow-calf ventures are time consuming, particularly during the calving period.

Seedstock (purebred) producers raise breeding stock for use in other herds. The seedstock producer must be a good cowherd manager, beef cattle breeder, and excellent merchandiser to survive. Establishing a good reputation for a seedstock unit does not happen overnight. A building period of at least five to seven years is needed to be a "player" in the purebred segment. Extensive advertising, personal contact, ranch visits, sale participation, and the study of genetic information is needed to excel in seedstock production.

Sources of Breeding Stock

Several sources of breeding animals are available and the choice between them will depend on the producer's finances, goals, and intended markets. Although the initial investment may be higher, it is likely beneficial to purchase breeding animals directly from a seedstock producer (by private treaty or at a production sale) or from a commercial producer (by private treaty or perhaps at a herd liquidation auction). The choice of whether to purchase purebred or crossbred animals will depend on the goals and market objectives of the producer. For example, if the intent is to produce and sell breeding animals (i.e., replacement heifers) or show stock (i.e., club calves), purebred stock may be desirable or required. However, if the intent is to produce and sell commercial calves or feeders, good quality commercial cows may be adequate. (Consistent and known genetics are still important.)

Perhaps the easiest but least desirable method is to purchase cows or heifers from auctions. Inexperienced producers may find it especially difficult to judge the quality and value of animals in the fast paced environment of an auction sale. It is even more difficult to use auction purchases to put together a set of cows with both the quality and consistency needed on the ranch. At the very least, such an approach requires patience, a keen understanding of the type and quality of cattle needed, and a willingness to trade more cattle by culling and reselling animals that do not fit the ranch and the herd. What seems like a cheaper way to start in the business may end up costing as much as or more than the alternatives.

After the initial cowherd investment, producers will quickly face two additional decisions about breeding stock: sources of bulls and replacement heifers. In most cases, the producer will want to purchase bulls from seedstock producers, either by private treaty, at a production sale, or through a bull-testing sale. Bull selection should reflect a clear direction in terms of maternal traits or terminal (carcass) traits. Although the temptation is great, many operations, especially smaller ones, cannot justify raising their own replacement heifers. Except for cases where the objectives clearly require (*and reward*) a high degree of genetic control, producers can find plenty of good quality replacement heifers from seedstock or commercial producers. This frees producers to focus bull selection on terminal traits.

Herd biosecurity (disease management) begins prior to purchasing the initial herd, or additional head, and prior to receiving recipient cows in an embryo transfer program. Knowledge of the disease history of the herd of origin is extremely important when it can be obtained. Diseases that lend themselves to testing prior to purchasing are brucellosis, tuberculosis, bovine virus diarrhea, Johne's disease, and, in bulls, trichomoniasis infections. The next step in herd biosecurity is a minimum 30-day isolation period prior to introducing the new animals into the herd. Depending upon the circumstances, specific Federal or state health and quarantine regulations may also apply to herd additions. Breeding soundness examinations of purchased bulls and the reproductive status of cows prior to purchasing are management tools that maximize the economic

[4]In some areas of the country, certain producers are small feedlot operators. Feedlots consist of confinement facilities and feed resources to maintain cattle for 100 days or more on high-energy diets until harvest date at a beef packing facility.

value of purchases. The veterinarian will be an important component in maintaining a herd's biosecurity and reproductive efficiency.

Breed Choices

Breeding systems rely on well-planned decisions on breeds, biological types, and performance choices. To be effective, these decisions consider production environment and resources along with carcass merit and market targets for offspring. Combining breeds for desirable production efficiency is not simple. A general comparison of breed types is helpful as a starting point. Then, genetic choices within a breed must match marketing targets as well as the production environment and resources.

Breed choices should optimize strengths in areas such as growth rate and mature size, lean-to-fat ratio, age at puberty, milk production, and carcass quality. Frame (hip height) and mature size should be monitored to assist in uniformity. Composite bulls may provide opportunities for certain cowherds assuming that the appropriate cattle type, performance criteria, and seedstock supplier can be identified. To assist beef producers in their choices of breeds, studies have attempted to group or categorize breeds into general biological types. The US Meat and Animal Research Center, Clay Center, NE, has extensive data on breed comparisons. Sire breed comparisons for various beef cattle traits are available at the web site: www.ansi.okstate.edu/breeds/research/marccomp.htm. Commercial producers can utilize a crossbreeding system to enhance herd productivity and efficiency. Additional details on the advantages of crossbreeding and potential pitfalls of misused crossbreeding are presented in the OSU publication, "Oklahoma Beef Cattle Manual," E-913, Third edition.

Managing the Cattle Enterprise

Matching Cows to the Environment

To be a low-cost producer, the cow-calf operator must choose a cow size that is appropriate for the production environment. Larger cows have greater maintenance requirements, meaning more forage per acre or more acres per cow. Cow size that cannot be supported by available forage resources requires management changes to maintain reproductive success. Stocking rate or supplementation or both may require adjustments to optimize rebreeding performance.

Size, growth, and milking ability of future daughters of bulls must be matched to the forage resources if replacement heifers are being kept. Uniform mature cow size contributes to uniformity in the calf crop since both parents pass a random sample half of their genes to their offspring. As an added benefit, a uniform cowherd is easier to manage in cases when feed supplementation is needed to maintain efficient reproduction. Caution must be practiced to avoid "chasing" extremes. The use of growth and maternal trait EPDs (expected progeny differences) must balance with other traits of economic importance, such as the reproductive complex.

Nutritional Management

As shown earlier in SPA data, the herd nutritional program represents a major component of production cost. Since the nutritional status of the cow is closely related to reproductive performance, producers are challenged with providing optimal supplementation at the lowest possible cost, while maintaining or improving reproduction. The overall goal of this section is to provide a basic knowledge of beef cow nutrition and management that will assist in evaluating supplemental needs and sources. Many feed ingredients, including traditional commodities and alternative feeds, are available to meet the nutrient needs of the beef cow. A cow-calf producer must first determine which nutrients are required and then evaluate the most effective nutrient sources for the lowest cost. With this in mind a four-step approach will be taken:

1. Determine the nutrient requirements for the ap propriate stage of production.
2. Anticipate the amount of nutrients that cows will receive from winter range or hay or both.
3. Determine supplemental needs.
4. Evaluate supplement alternatives.

Nutrient Requirements. Nutrient requirements for beef cows include those for water, energy, protein, minerals, and vitamins. Age, size,

Table 6. Beef cow nutrient requirements during mid and late pregnancy[1]

Cow Weight (lb.)	*Dry Matter Intake (lb.)*	*NEm[2] (Mcal/day)*	*Crude Protein (lb./day)*	*Calcium (g/day)*	*Phosphorus (g/day)*
Middle 1/3 of pregnancy					
1000	19.6	7.72	1.48	13.42	11.03
1100	21.1	8.31	1.58	14.77	12.13
1200	22.5	8.88	1.70	16.11	13.23
Last 1/3 of pregnancy					
1000	19.8	9.61	1.61	13.42	11.03
1100	21.3	10.39	1.74	14.77	12.13
1200	22.7	11.14	1.85	16.11	13.23

[1]Adapted with modifications from Nutrient Requirements of Beef Cattle, NRC, 1996.
[2]Net energy for maintenance.

Table 7. Beef cow nutrient requirements during early lactation (1st 90 days)[1]

Weight (lb.)	*Milk (lb./day)*	*NEm[2] (Mcal/day)*	*Crude Protein (lb./day)*	*Calcium (g/day)*	*Phosphorus, (g/day)*
1000	10	12.07	2.07	24.59	17.36
1100	10	12.73	2.16	25.93	18.44
1200	10	13.36	2.25	27.28	19.51
1000	15	13.70	2.46	30.18	20.68
1100	15	14.36	2.55	31.52	21.75
1200	15	14.99	2.64	32.86	22.83
1000	20	15.33	2.85	35.76	24.00
1100	20	15.98	2.94	37.10	25.07
1200	20	16.62	3.03	38.45	26.14
1000	25	16.96	3.24	41.34	27.32
1100	25	17.61	3.33	42.69	28.39
1200	25	18.25	3.42	44.03	29.46

[1]Adapted with modifications from Nutrient Requirements of Beef Cattle, NRC, 1996.
[2]Net energy for maintenance.

breed, body condition, milk production potential, expected calf birth weight, hair coat length in relation to current temperature, and various other environmental effects influence a cow's requirements. The influence of the cow's size and milk production on nutrient requirements during gestation and early lactation is demonstrated in Tables 6 and 7.

Nutrient Contribution from Forage. Anticipating nutrients supplied by the forage base is the most difficult task in beef cow nutrition. The formula is simple:

Forage intake x concentration of available nutrients in the forage

However, many factors influence both components in this formula. Forage intake is dramatically influenced by both forage quality and forage avail-

ability, and these factors vary dramatically from year to year and month to month. Despite many years of research, an accurate method to account for all this variation in predicting forage intake remains illusive. General guidelines for estimating forage intake are included in Table 8, and are expressed as a percentage of cow body weight. In general, intake is lower with lower quality forages and increases considerably with the onset of lactation.

The next step is to estimate nutrient content of standing forage or hay. As mentioned earlier, these values are also variable, depending on forage type, maturity, and weathering. The most accurate method to determine supplemental needs for cows that will receive primarily a hay diet, is to have the hay analyzed for nutrient concentration. This will cost from $15 to $40 per sample, but can save hundreds, even thousands of dollars in some cases. Table 8 includes "average" nutrient values for a few common forages found in Oklahoma. Nutrient analyses of clipped standing forage samples are less useful, because cows have the opportunity to selectively graze. In fact, cows almost always select a higher quality diet than is reflected in clipped pasture samples. A more practical approach would be to use the values in Table 8 as a base line for winter range nutrient content. Then, managers can adjust supplemental needs based on forage conditions, cow condition, and experience.

Supplemental Needs. Once nutrient requirements have been established and a reasonable estimate of the nutrient contribution of the forage has been made, determining supplemental needs is simply a comparison of the two. For this discussion, we will assume cows will graze winter range (receive little or no hay supplementation). Average cow weight will be 1100 lb. and average calving date is March 15. Consequently, these cows would be grazing low quality winter range throughout the last one-third of gestation. By using the information in Table 6 and Table 8, supplemental needs for a cow grazing winter range were calculated (Table 9). Without supplementation, this group of cows would be considerably deficient in both protein and energy, and would be expected to lose considerable body condition before calving.

Evaluating Supplement Alternatives. Many energy and protein dense feeds are available to Oklahoma cattlemen due to grain and cotton production in the Mid-west and Great Plains. Evaluating and capitalizing on low cost supplements requires some knowledge of beef cow nutrition, a mechanism to track markets, and the ability to contract or store feeds in advance of the feeding period. In addition, cost of ingredients for the supplementation program is only part of the story. Some alternative feeds are bulky and difficult to handle. In many cases, storage for truckload lots must be available in order to reduce transportation costs. Available labor and feeding system must also be considered, and may limit the options for many producers.

Table 10 illustrates cost per ton and cost per unit of protein and energy for several feeds. Costs for these feeds were estimated based on prices in February 2000. Certainly, costs may vary from the values in the table, depending on source, transportation costs, and other factors.

Table 8. Average nutrient content of selected forages (dry matter basis)[1]

	Crude Protein	*NEm*	*Calcium*	*Phosphorous*	*Estimated Intake*	
					Gestation	*Lactation*
Hay Type	(%)	(Mcal/lb.)	(%)	(%)	*(% of body weight)*	
Winter range	5.0	.41	.26	.15	1.8	2.0
Prairie hay	6.4	.45	.35	.14	1.8	2.2
Bermuda hay	7.8	.42	.47	.20	1.8	2.0
Sorg/sudan hay	8.0	.52	.55	.30	2.0	2.3

[1]Nutrient Requirements of Beef Cattle, NRC, 1984 and 1996.

Table 9. Nutrient supply compared to requirements for 1100 lb. beef cow grazing native range during last one third of pregnancy

	Crude Protein (lb.)	*NEm (Mcal)*
Required	1.74	10.39
Supplied by forage	.99	8.12
Supplemental need	.75	2.27

Table 10. Protein and energy content and cost of various supplement sources

Feed	*Product (cost/ton[1])*	*Protein (% as fed)*	*Protein (cost/lb.)*	*NEm (Mcal/lb. as fed)*	*NEm (Cost/Mcal)*
20% cube	$140	20.0	$.35	.74	$.09
25% cube	$156	25.0	$.31	.71	$.11
38% cube	$199	38.0	$.26	.68	$.14
Corn	$ 99	8.8	$.56	.90	$.06
Milo	$ 87	10.8	$.41	.81	$.05
Cotton seed meal (41%)	$145	41.0	$.18	.78	$.09
Alfalfa hay	$ 75	15.0	$.25	.49	$.08
Wheat middlings	$ 90	15.2	$.30	.74	$.06
Soybean hulls	$ 78	10.9	$.36	.76	$.05
Corn gluten feed	$ 90	22.5	$.20	.79	$.06

[1]Costs of all feed sources are subject to change. This exercise is intended as an example only.

In general, higher protein feeds are usually cheaper sources of protein and high-energy feeds that are low in protein are cheaper sources of energy. However, cost per unit of protein or energy cannot be used exclusively in evaluating these alternatives for this scenario, because our "model" cowherd requires supplemental protein and energy. If the cows were in excellent condition (condition score of six or greater), two pounds of the 38% cube or two pounds of cottonseed meal could be fed to meet the protein requirement. The net effect would be to maximize forage intake and digestion, with the understanding that the cows would lose some weight and condition, due to a slight deficiency in energy intake. For cows in moderate body condition, both energy and protein requirement must be met in order to maintain weight and body condition prior to calving. Table 11 demonstrates various supplementation programs and costs that would meet or exceed both protein and energy supplementation needs.

Notice that protein must be overfed with the 38% cubes in order to meet the energy need. Conversely, energy must be overfed in the case of soybean hulls and wheat middlings in order to meet the protein need. In fact, forage intake is reduced substantially through feeding this much concentrate (greater than four pounds per head). Therefore, the protein and energy contribution from the forage would need to be reduced. Because of the low quality forage diet, these cows require considerable supplemental protein and energy. Consequently, feeds that are moderate in protein (around 25% CP) and high in energy are the most economical supplements in this scenario. Obviously, for cows receiving bermudagrass hay or sorghum sudan hay (Table 9), low protein, high energy feeds would be more economical.

Another rule of thumb to consider is to keep total grain (corn and milo) intake below 3 pounds per head per day (.25% of body weight). Greater amounts cause reduced forage digestibility and

Table 11. Supplemental feed cost for 1100-pound beef cow grazing winter range during late pregnancy

Item	Amount fed (lb./day)	Protein (lb.)	NEm (Mcal)	$/day	$/90 days
Supplemental need[1]		.75	2.27		
20% cube	3.75	.74	2.77	.26	23.63
25% cube	3.00	.76	2.13	.23	21.06
38% cube	3.00	1.13	2.10	.30	26.87
Corn/CSM[2]	3.00	.75	2.53	.18	16.47
Milo/CSM[3]	3.00	.78	2.40	.17	15.66
Alfalfa hay	5.00	.74	2.44	.19	16.88
Wheat middlings	5.00	.76	3.70	.23	20.25
Soybean hulls	7.00	.76	5.36	.27	24.57
Corn gluten feed	3.25	.73	2.57	.15	13.16

[1]From Table 9.
[2]50% corn, 50% cottonseed meal mix.
[3]50% milo, 50% cottonseed meal mix.

intake. However, supplements that combine grain and high fiber feeds, such as soybean hulls and wheat middlings can be fed up to four to six pounds (.5% of body weight) without having much effect on forage utilization.

Milo and alfalfa hay may be considered as alternative supplements some winters, particularly when the Oklahoma milo crop is large. Even though corn gluten feed must be shipped from 350 miles away, it is still an excellent alternative based on nutrient values and prices we have assumed in this example.

In summary, reducing feed costs, while maintaining performance is a must for Oklahoma cow-calf producers. By using a systematic approach to evaluating beef cow nutritional requirements, forage nutrient contribution and alternative supplemental sources, an optimal winter nutrition program can be designed. The lowest cost alternative will not always be the best program due to the relative value of convenience, labor availability, and feeding system. The most effective way to evaluate alternatives is to first determine the cost of the total supplementation program, then compare differences in cost with other factors.

Maintaining and Promoting Herd Health

A veterinarian is an important team player for developing a herd health program and is necessary for performing procedures and caring for animal health emergencies beyond the producer's skills or capabilities. Tools that will assist in maintaining and promoting herd health include:

- Good fences
- Good corrals and chutes
- A simple and consistent record system to track health events, monitor herd performance, and assist in making decisions (envelopes, paper towels, and barn walls are not suitable forms of records).

Adequate fencing and corrals are needed to safely and effectively handle livestock. Appropriate pasture groupings may be needed to maintain the various classes of cattle. For example, a ranch may need a bullpen, breeding pasture for first-calf heifers, an area for heifer development (if replacements are raised) and an area for post-weaning calves (if ownership is retained). Detailed descriptions and diagrams of working facilities are available in the OSU publication, "Modern Corral Design," E-938.

Calving and the Newborn Calf. Difficult births are a major cause of calf mortality. Approximately 17% of all calving heifers need assistance. Approximately 2.5% of all calving cows need assistance. Heifers should be checked for calving difficulty at least twice daily and should be assisted in less than two hours, if they have not calved but have membranes or feet showing. Approximately 2.5% of beef calves that are born alive die within

the first three days of life. Heifers and cows need to calve in clean areas to prevent navel infections, calf scours, and retained placentas in the cow.

Colostrum is the major source of disease protection that the calf receives from the cow. A calf must receive at least 10% of its body weight (for an 80 lb. calf, two quarts within the first six hours, another two quarts six hours later) in high quality colostrum within 12 hours of birth for maximum transfer of maternal antibodies. Antibody transfer can fail or be hindered by the following problems:

- Difficult birth causing a depressed calf
- Chilled calf
- Poor maternal instincts in the cow
- Mastitis
- Large teats
- Hard milking teats
- Poor conditioned cows with little or poor quality colostrum
- Good milking cows with dilute colostrum
- Leaking colostrum before birth

The best replacement for a dam's colostrum is fresh or frozen high quality colostrum, preferably from an older cow that has been on the premises for as long as possible. Frozen colostrum should not be thawed in boiling water or in a microwave on high power setting; gradually thaw it to preserve the antibodies.

Moving calves from calving pens or sheds in a timely manner will aid in preventing "calf scour syndrome." Common feeding and loafing areas or overcrowding allows for easier transmission of scour causing organisms.

The Calf - Three Weeks to Three Months of Age (Branding Time). This period is a very important time to institute disease prevention and parasite control and perform surgical procedures. Growth implants can return up to $10 for a $1 investment. For tips on disease prevention, consult your veterinarian. Clostridial vaccines, intranasal viral (IBR and PI3) vaccines, Leptospira vaccines, parasite control, internal parasite monitoring, deworming, fly control (also may mean pink-eye control), louse control in fall born calves, and tick control may be herd health practices recommended. When performed at an early age, surgical procedures like castration and de-horning, cause less stress to the animal. Such practices increase the selling price for the animal, adding value to the bottom line.

Breeding Season. The breeding season for replacement heifers should begin two to three weeks prior to the breeding season for cows. This allows for more time to focus on calving heifers. It also allows for more time for post-calving healing and a return to proper body condition so heifers can be bred again. The heifer must grow, develop a calf, calve, milk, and maintain or gain body condition to return to estrus.

It is economically prudent to have a defined breeding season of not more than 90 days. Defined breeding seasons (fall, spring, or both) must be established, with specified bull turnout dates. A 90-day breeding season is preferred and requires that bulls be managed and maintained separately from the cowherd during the remainder of the year. This allows for calves to be more uniform at weaning and selling, increasing their value. It also decreases labor when performing health and management practices, as you only have to start-up one time. Increasing the proportion of calves born at the beginning of calving season makes for heavier calves at weaning time and selling time.

Bulls should be examined for breeding soundness and have a scrotal circumference measurement established prior to purchase, lease, or turning out with the cows each year. Older bulls should be examined for Trichomonas, a sexually transmitted organism that causes abortions and decreased fertility in the female. Bulls should be dewormed at examination time and vaccinated against campylobacter fetus, leptospirosis, and anaplasmosis (consult your veterinarian).

Cows will begin their estrus cycle and breed back sooner after calving if they are in a body condition of five or higher on a scale from one to nine.[5] Assess body condition by weaning time and take measures to correct deficiencies. Expect weight loss due to calving and lactation. Body condition of the cows at calving time is critical to rebreeding success. Maintain body condition leading to and throughout the breeding season and while the cow

[5] Producers can learn about the body condition scoring system by purchasing a copy of the Oklahoma Beef Cattle Manual (E-913).

is lactating to optimize pregnancy rates. Fall calving cows have a foraging advantage of calving after summer growing seasons. They are often in excellent body condition at calving and, unless forage availability is quite low, they can maintain good body condition with extra protein supplementation or cool season forage. Rebreeding should be done by mid-January. After the breeding season, moderate body condition loss can be tolerated because summer pastures will allow for body condition to be recovered before the next calving season.

Spring calving cows often calve in poorer body condition unless considerable cool season forage or supplementation—which can be costly—is made available. Many producers erroneously believe that they can allow cows to calve in thin body condition in the spring and, with the onset of spring grass, rebound to good body condition and attain high reproductive rates. Data have shown conclusively that cows that calve in thin body condition do not rebreed at the same rate as those that calve in good condition and maintain that condition into the breeding season.

Table 12 illustrates the number of days between calving to the return to heat cycles depending on body condition at calving and body condition change after calving. These data clearly point out that young cows which calve in thin body condition (BCS = 3 or 4) cannot gain enough body condition after calving to achieve the same rebreeding performance as cows that calve in moderate body condition (BCS = 5.5) and maintain or lose only a slight amount of condition.

Cows must be rebred by 85 days after calving to calve again at the same time next year. Notice that none of the averages for cows that calved in thin body condition were recycling in time to maintain a 12-month calving interval. If the producer chooses to cut winter feed costs for spring calving cows, reproductive performance will suffer. If the cows are allowed to calve as thin (BCS = 4) versus moderate to good (BCS = 5 to 6), the feed costs must be reduced enough to make up for a 20 percent reduction in weaned calf crop. The reduction in total per cow costs must exceed 20 percent of the sale price of a weaned calf. For most operations this would equate to halving the total feed and pasture bill and only losing one body condition score on the cows by calving time.

In times of higher calf prices, producers may be tempted to push for maximum production by having the cows in a body condition of six to seven. To be profitable, added expense must be less than ten percent of the potential selling price of the calf. Using a $1.00 per pound price, an extra body condition score on cows would need to cost less than $50 per head (0.1 x 500 pounds x $1/lb).

Young cows (two to three years old) need to be fed separately from older cows. This may require additional electric fencing to separate them from the older cows. They must be fed enough high quality forage or supplements or both to assure that they are in a body condition score of six at calving time. Disappointing rebreeding performance will result if they are allowed to be thinner at calving time. Deworming cows at this time will assist in maintaining body condition, aid in milk production, and decrease pasture contamination with infective stomach worm larvae.

Table 12. Predicted number of days from calving to first heat as affected by body condition score at calving and body condition score change after calving in young beef cows (Body condition score scale: 1 = emaciated; 9 = obese)[1]

Condition score at calving	*Condition score change after calving to day 90*						
	-1	-0.5	0	0.5	1	1.5	2
3	189	173	160	150	143	139	139
4	161	145	131	121	115	111	111
5	133	116	103	93	86	83	82
5.5	118	102	89	79	72	69	66

[1]Adapted from Lalman, 1996.

Pre-weaning Practices. To be most effective in controlling distress and diseases associated with weaning, calves should receive their booster vaccines and other remaining procedures three weeks prior to weaning instead of at weaning. Vaccines given at this time should be recommended according to the immune status of the cowherd and under the supervision of a veterinarian.

Weaning Time. Disease is the result of a compromised immune system in the animal resulting from distress (disabling the body defense mechanisms), lack of immunization (through natural or vaccine exposure), and exposure to high concentrations of infective agents (viral, bacterial, or parasitic). The distresses of weaning can be minimized through feed and water management, prevention of overcrowding, dust control, management of weather extremes where possible, and decreasing processing distress. Vaccines should be administered early in the weaning period in consultation with a veterinarian. Recommendations may include clostridial booster vaccine, IBR, PI3, BRSV, BVD viral vaccines, brucellosis vaccine to all replacement heifers, leptospirosis vaccine, deworming, and other parasitic control, implanting and coccidiosis control measures, coccidiostats in feed or water, and feed and water contamination control measures.

Commonly, five to ten percent of cows are open (not pregnant) at the end of breeding season. An open cow produces no calf (and thus no income) but continues to eat, require health care, etc. To minimize the number of open cows, palpate all cows for pregnancy and manage open cows as best fits your situation. Age all cows. Check for bad, eyes, feet, legs, and udders. Cull those cows that flunk any test. In addition, deworm, control grubs and lice, and vaccinate against leptospirosis, campylobacteriosis, and other diseases as prescribed by your veterinarian. Evaluate the body condition of these cows and make adjustments in nutrition, if needed.

The Replacement Heifer. The replacement heifer is very important to the cow/calf operation and needs special attention for a productive life. Replacement heifers need proper nutrition for growth to cycle and breed in time to calve at two years of age. Proper vaccinations four to six weeks prior to breeding (check with your veterinarian) may include modified live IBR, PI3, BRSV and BVD vaccine, leptospirosis-campylobacteriosis vaccine, and seven-way clostridial vaccine. Deworm six and four weeks prior to calving if needed. Vaccinate to increase the colostral antibodies for the calf's protection against the following causes of calf scours: *E. coli bacterin*, *Rota* and *Corona virus*, and *Clostridium perfringens* type C toxoid. Finally, select a bull that will produce calves with lighter birth weights for use on heifers.

Performance Information

Commercial producers as well as seedstock breeders need an effective performance evaluation program that encourages the culling of inferior animals and selection of herd replacement breeding stock. Rarely are effective selection programs based on single traits. Sire selection is the area where commercial herds can make the biggest impact on future calf crops. Commercial cowherd and calf crop records are the "nuts and bolts" to assist producers in choosing the appropriate bull.

Performance information is a tool to enhance the production efficiency, profitability, and marketability of the calf crop. The performance evaluation program should address breeding, calving, weaning, yearling, carcass, and maternal objectives. Genetics are not solely responsible for uniformity in a calf crop; management practices can "make or break" a good set of calves. The focus of today's beef industry, however, includes genetics as an integral part of its success and future.

The use of expected progeny differences (EPDs) allows producers to compare or rank the superiority of individual bulls for traits of economic importance. Sale catalogs and performance reports for bulls often include EPDs for birth weight, calving ease, weaning weight, yearling weight, maternal milk, scrotal circumference, gestation length, as well as carcass traits. EPDs allow the prediction of performance differences, not actual performance. Actual weights are less reliable predictors of future progeny performance than EPDs. Additional information about EPDs (including maternal milk EPDs) is available in the OSU Fact Sheets F-3159, 3160, 3161 and 3162.

Production Record Keeping

Monthly calendars, journals, and Integrated Resource Management (IRM) Redbooks[6] are a few examples of handwritten record systems. Seedstock and commercial cow-calf producers have different needs. Also, herd size can influence the degree of detail that a producer is willing or able to assemble on the cattle. Breed associations provide services to members for documenting and tracking the performance of a herd. Seedstock breeders should certainly consider these programs.

Meaningful cow-calf records may be handwritten or computerized. The challenge is in developing a system and choosing performance records that are useful in making management decisions. Producers who have home computers frequently ask about the availability of software programs to handle cow-calf production records. Information about commercially available beef cattle performance software is available in the OSU Current Report 3279. Before purchasing a software program, analyze the value of the system to making better management decisions.

Livestock Marketing

Agricultural production involves lags between the time that production decisions are made and the time that resulting production is available for sale. This means that producers are exposed to the risks of unanticipated price changes as well as production risks that affect the quantity and quality of production. Thus, marketing, for all agricultural producers, involves balancing the producer's financial and emotional attitudes towards risk with available marketing alternatives and the producer's willingness to learn and use various marketing tools.

For many producers, the primary attraction of agriculture is production; they would rather not spend much time worrying about marketing. For these producers, marketing is primarily a matter of identifying a defensive marketing strategy. This strategy should provide them with some protection from the vagaries of the marketplace and require a minimum of time, effort, and sophistication. Other producers are drawn, not only to the challenges of agricultural production, but also to the challenges of matching wits with the marketplace. For these producers marketing is an offensive, aggressive part of the business. These producers enjoy the thrill of trading as well as identifying and exploiting buying and selling opportunities. In addition to managing risk at an acceptable level, they also seek to capitalize on speculative opportunities that may be present in the market. For these producers, a wider variety of more sophisticated, management intensive marketing tools are available.

Whether marketing is viewed from an offensive or defensive perspective is determined, not only by the producer's personality and emotional attitude towards risk, but also by the producer's financial position; therefore, perspectives may change over time. In many cases, younger or newer producers who are more financially vulnerable are forced to take a relatively defensive posture towards market risks simply because the consequences of an adverse outcome could be irreparably devastating. Those same producers, at some later time when they have larger equity positions or less debt, may be able to bear more risk or spend less money to reduce risk when the consequences are not so critical.

The Marketing Plan

A written marketing plan helps producers consider production cost, available alternatives, risk management, and market outlook. A producer's ability to manage risk depends on early knowledge of production costs, assessment of market outlook, and identification and evaluation of available alternatives. The marketing plan will help producers evaluate marketing alternatives and opportunities relative to costs, profit, and risk management objectives. A simply written marketing plan form is available in F-521.

The Cyclical Nature of the Cattle Industry

The beef industry is characterized by cycles of production and prices. These cycles are caused by a complicated set of industry dynamics but the net effect is that cow-calf producers routinely experience periods of low revenues that usually re-

[6] Redbooks are available from the National Cattlemen's Beef Association.

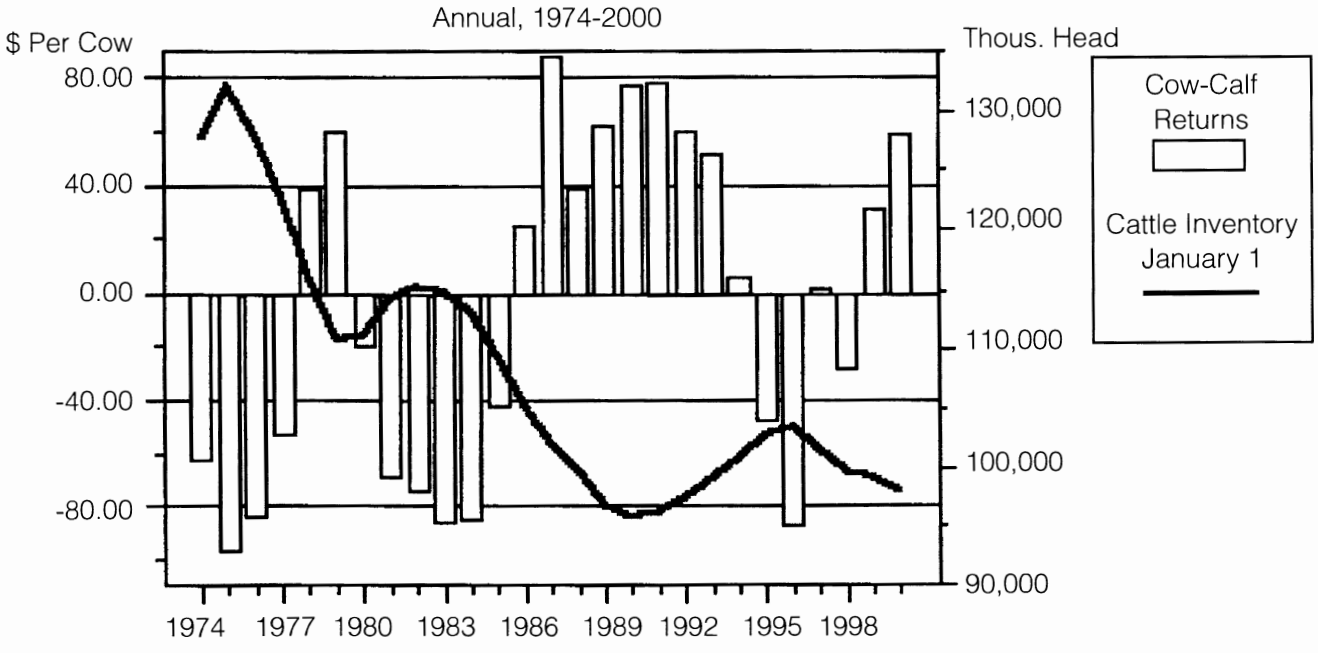
sult in losses. Figure 3 shows recent cycles of cattle inventories and cow-calf profitability and confirms that the two are correlated. These losses occur primarily because the market sends signals to cow-calf producers to adjust production. Producers must address ways to anticipate these signals and mitigate the negative economic effects of cattle cycles.

The strategic alternatives available for cow-calf producers to manage for cattle cycles are mainly in two areas: strategic herd size adjustments and cost management. In simple terms, the losses associated with low cattle prices should be interpreted as the market's way of telling producers that fewer calves are needed or, more specifically, that some forage should be used to produce something other than weaning calves. Usually, that something other is more pounds of stocker cattle using forage. The low price part of the cattle cycle is a signal for cow-calf producers to reduce cow numbers and use excess forage for stocker production. This is what happens in the aggregate to the industry during this part of the cycle. Of course, the extent to which an individual producer can make these adjustments will depend on many considerations of location, production flexibility, management, and financial implications.

An alternative is strategic cost management. Some of this is included in the herd adjustments referred to above because reducing cow numbers during low price periods will reduce the maintenance costs. In addition, cow-calf producers can anticipate low price periods and change the timing of some costs to minimize cash outlays during low prices. Examples include timing bull replacement, capital improvement (fencing, equipment, etc.), and fine-tuning forage management (brush/weed control, fertilization, etc.). Most of these must be done but not necessarily every year.

Finally, it is important for cow-calf producers to remember that cycles of profitability imply a need to build equity during high price years, recognizing that low prices will likely cause some erosion in equity on a periodic basis. Recognition of the cattle cycle and the attendant implications also suggest that initial timing of entry into the cow-calf business should be carefully considered. Depending on the current timing of the cattle cycle, new producers may want to consider delaying the cow investment

Figure 3. Cow-calf Returns and Cattle Inventory



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for a year or two (perhaps using stockers instead). They may want to consider the advantages and disadvantages of buying mature cows already in production versus young heifers that must be grown out before calving. Careful planning of the timing and manner of entry of new producers may greatly influence the likelihood of success or failure in the first years of the new enterprise.

Cattle Marketing and Terms of Trade

Producers selling breeding animals or show stock will likely sell by private treaty under widely varying and unique terms. Beyond that, most producers will sell calves or retained yearlings either at a public auction or direct from the ranch. Both types of arrangements have advantages and disadvantages. Public auctions are simple and have the presumed advantage of many buyers competing for your animals thus ensuring a competitive price. Most producers have the choice of several local auctions and one or more larger, regional auctions where animals can be marketed. The choice between different auctions should consider such factors as transportation costs, commission and other fees, shrink, types of service offered, day of sale, the type, number and quality of animals you are selling, and possibly the time of year. Different auctions vary in the types of animals that constitute the majority of sales and consequently attract different types of buyers, all of which may vary with time of year.

Sale barn studies document price differences by weight, breed, sex, frame, muscling, gut fill, body condition, health, number of cattle in a sale lot, uniformity of the sale lot, and health of the livestock.[7] Recommendations for maximizing the potential price received include:

- Use a breeding program that results in cattle that grow efficiently and produce a desirable carcass.
- Castrate all bull calves not intended as sires. Implant steers to compensate for any potentially reduced gains.
- Dehorn calves while young (or use a polled bull).
- Market calves in average flesh.
- When possible, sell uniform sets of calves (multiple head of similar gender, frame, muscling, weight, color, etc.).

Direct selling from the ranch, when possible, offers different advantages and disadvantages compared to auctions. Direct selling avoids or reduces transportation costs, auction fees, animal handling, and shrink. The main disadvantage is that the producer must know the value of animals, have some negotiating skills, and understand different terms of trade. Country sales often involve varying terms of trade for "pencil" shrink, price slides (especially for forward contracts), and payment. Producers must fully understand these factors in order to legitimately compare country sales bids to auction prices.

Contracting and Hedging

Producers who wait until cattle are ready to sell face the risk of adverse price changes during production. Managing this risk can involve forward pricing cattle earlier in the production period. Basic alternatives include forward cash contracting or some form of hedging with futures or options. Cash forward contracting is simple but may not be feasible in some areas and for smaller producers. In some locations, forward contracting is simply not a common practice. Producers with only a few head of cattle may have difficulty finding buyers interested in contracting small lots.

Cash forward contracting sets a fixed price on cattle in advance of the marketing date. However, in many cases, cash forward contracts are informal, verbal agreements. In cases where market prices drop dramatically between the contract date and the delivery date, in other words, in cases where the contract has the most value, the buyer may simply default on the contract. Producers using cash forward contracts are encouraged to collect at least 10-20 percent down on forward contracts to ensure performance of the contract or cover some losses in case of default.

Hedging cattle with futures or options reduces (but does not eliminate) market risks by combining two offsetting transactions. Basic hedging is not complicated but requires more effort to implement and carry out the futures transaction along with the normal cash transaction. Hedging requires an ac-

[7]See "Effect of Selected Characteristics on the Sale Price of Feeder Cattle in Eastern Oklahoma," OSU publication E-955.

count with a commodity broker and will have some additional fees but is safe in terms of contract performance. The risks of hedging relate to how well the cash and futures transactions match up (the concept is called basis). Additional information on use of futures and options can be found in F-430, F-431, F-432, F-433, CR-522, F-540, and CR-542.

Retained Ownership

Cow-calf producers may have the alternative of retaining ownership of calves beyond weaning through the stocker or feedlot phases or both. Retained ownership is often viewed as a marketing alternative as it changes the size, timing of sale, and quality of animals. Although it may be beneficial from a marketing standpoint, retained ownership through the stocker phase should be evaluated as a separate economic activity. The profitability of stocker production is driven by market prices that vary according to cattle cycles. Occasionally, there is a strong incentive to reduce cow numbers and retain calves through the stocker phase. In other cases, it may be beneficial to increase cow numbers and sell weaning calves.

In specific instances, it may make sense for cow-calf producers to retain ownership into the feedlot. However, feeding cattle on a custom basis involves considerable additional capital. Since this method involves mostly out-of-pocket cash costs, it should be viewed as an investment decision. Under most market circumstances, a cow-calf producer will benefit from custom feeding only if the cattle are better in quality and performance, and those benefits can only be captured by retaining ownership. In rare market circumstances, the value of feed or changes in market timing due to feeding cattle will reward retaining ownership.

One final marketing alternative that may be available to producers is the use of satellite video or internet based auctions. These combine the advantages of competitive bidding among many buyers with the reduced shrink and handling of direct country sales and the possibility of forward pricing the animals. Like other auctions, satellite or internet auctions tend to work better for some circumstances than others, specifically favoring large lots of uniform animals. Additional information can be found in F-445 and CR-529.

Tax Issues and Tips

Not taking care of business has doomed more cattle ranches than drought or cattle prices. Potential ranchers must comply with Internal Revenue Service, Social Security Administration, Department of Immigration and Labor (if labor is hired), and state and local taxing authorities. Payroll taxes, self-employment tax, and the possibility of having a ranch declared a hobby are the most likely problems for new and existing ranchers.

Payroll Taxes

If an employee is paid more than $150 per year or total payments to all employees exceed $2500 per year, the ranch business must get a federal ID number and report payroll taxes. A Taxpayer Identification Number (TIN) can be obtained by filing form SS-4 with the Internal Revenue Service center in your district. Federal and State income tax, and Social Security and Medicare taxes must be withheld and deposited. Form W-2, W-3, and 943 must be filed by January 31st for the previous calendar year. See IRS Publication 51 Circular, "Agricultural Employer's Guide," for complete details.

Self-employment Tax

Individuals who are employed by a company should receive a Form W-2 stating their wages and withholdings. Based on a W-4 withholding form, employers withhold and pay the withheld income tax for each employee to state and federal tax authorities. Individuals who are in business for themselves must report income and expenses from that business on IRS Schedule C or Schedule F if the net income is at least $400. This net income is subject to 15.3 % self-employment tax up to the maximum for 2000, $76,200. Net income above that level is subject to only Medicare taxes of 2.9 % without limit. These self-employment taxes are in addition to income tax due when net income from self-employment is combined with the individual's income from other sources on Form 1040. Self-employed individuals must also make quarterly deposits of estimated income tax to avoid tax penalties. If more than two-thirds of total gross income from all sources is from farming or ranching, quarterly estimated tax

payments are not required if the individual's tax return is filed by March 1.

Hobby Loss

An often-misunderstood area of taxation is *hobby loss* and business owners should be aware of its implications. Briefly, to deduct expenses in excess of income for a given venture, you must be engaged in that venture for a profit. These rules were originally developed by Congress to set up an objective standard to determine whether a taxpayer has a legitimate business operation or is merely attempting to generate tax losses to offset other income. If there is no intent to make a profit, the IRS assumes that the activity is a hobby and will disallow the deductions in excess of income. The general test to measure the profit motive is whether the activity has generated a profit in any three of five consecutive tax years. If the activity deals with breeding, training, showing, or racing horses, the test is any two of seven years. For the struggling rancher whose business venture is not showing a profit, the worry that the IRS will disallow all deductions can be stressful. There is more information, however, available to help the taxpayer in this situation.

Once the business has failed to show a profit as described above, the IRS has the discretion to review the business' records. This does not automatically mean that they will, only that they can. In addition, the test does not automatically determine whether a business should be considered a hobby, only that the IRS can look at it. All facts will be considered in determining whether a business has been operated with a profit motive or not. Nine factors are set forth in IRS regulations to be used as a guideline. These relevant factors are used only as a guideline — no one factor or group of factors determines the outcome. It is a subjective judgment call where all facts are taken into account. Taxpayers can protect themselves by being aware of these nine factors and using them as a guideline. Most importantly, the taxpayer can further protect himself by keeping good records to document actions that indicate a profit motive based on the following nine factors:

1) Is the activity carried out in a businesslike manner? If the taxpayer keeps businesslike books and records, changes methods of operation that aren't working, tries to use techniques of profit-making ventures to increase efficiency and profitability, or even abandons a business venture that is going nowhere, the profit motive may be indicated.
2) Can the producer take advice? What is the expertise of the taxpayer or his/her advisors? The taxpayer should be able to show that he or she has studied the accepted practices of the venture or has sought advice from experts in the field or both. This may include reading books, taking classes, paying advisors and taking their advice. If the producer has received advice and information and has operated in a completely different manner, he or she should be prepared to explain attempts to develop new practices, which could result in profit.
3) Is the taxpayer spending any time here? How much time and effort is expended by the taxpayer? If the producer is spending significant personal time and effort on the activity, it can indicate a profit motive. Employing competent persons to run the activity for the taxpayer may also indicate profit motive.
4) Does anything have value? Are the assets expected to appreciate in value? Overall profit could be reasonably expected from increase in value of land, cattle, or other assets even if operations of the business are not showing a current profit.
5) Has the taxpayer been profitable in carrying on this or similar activities in the past? If the taxpayer has carried on similar activities in the past and turned them from unprofitable to profitable, a profit motive could be assumed.
6) What is the history of income or loss? Are losses mainly a start-up situation or have they been sustained beyond a reasonable length of time? If there have been unforeseen circumstances beyond the taxpayer's control such as drought, fire, theft, war, depressed market conditions, etc., the reasonable length of time for loss could be extended. Again, very good records would help support this type of claim.
7) Has the operation made *any* money? What is the amount of profits, if any, that have been earned? The occasional small profit from a ven-

ture offset by persistent high losses would probably indicate that there is no profit motive. A solid profit, though infrequent, or a reasonable opportunity to achieve an eventual profit, might back up the taxpayer's profit motive.

8) Is the taxpayer making any money doing anything else? What is the financial status of the taxpayer? If there is no substantial income from other sources, it is a good bet that the activity is meant to generate a profit. However, the presence of other income, especially during the start up period of a venture, only shows good planning, and would not necessarily negate the profit motive.
9) The IRS has declared a business to be a hobby if the owner garners personal or recreational pleasure from its activity; however, factors mentioned previously in this article are also taken into account by the courts. The fact that a person enjoys a business is not sufficient cause to disallow the profit-making motive.

If you choose to engage in beef production for a profit, KEEP GOOD RECORDS! If you take a class related to the business, consult with an accountant or business expert, or buy a book, keep the receipts. If you have taken advice and changed a method of operation to improve efficiency, write it down. If flood, drought, or disease in the area has affected your business profits, write it down. Cut out the news articles, count your work hours, record mileage, retain business transactions, and we'll hope you make a profit next year.

The above general information is provided to educate taxpayers about the income tax consequences of hobby losses. If you need detailed information or feel that your farm or business operation is in danger of being declared a hobby by IRS, please contact the Area Extension Economist, State Extension Tax Specialist, or your income tax preparer.

Summary

Individuals take up ranching for a multitude of reasons including the romance of the lifestyle or an opportunity to manage natural resources. Although ranching can be rewarding in many ways, potential ranchers should realize that making a profit, especially from small operations, is difficult. The cow-calf producer is in the business to produce beef as efficiently as possible, which requires a balance of production performance and end product merit that fulfills consumer satisfaction. Your genetic selection program should have goals for growth and size, reproduction, maternal performance, and carcass merit. Determining the balance of these traits for the herd is a challenge.

Many factors have a direct effect on the potential success of the ranching operation. These factors include site productivity, experience level of the manager, and close attention to details regarding:

- Business planning and record keeping
- Forage production, management, and utilization
- Livestock selection and care
- Animal health and nutrition
- Marketing and risk management
- Compliance with tax laws

These aspects are under direct control of the manager. Factors that are not under control of the manager include the weather and market forces. Still, the good manager has a plan for coping with these ever-present risks.

Potential ranchers should thoroughly familiarize themselves with the both possibilities for success and the pitfalls that can turn the dream of a lifetime into a drain on precious resources, such as time and money. For additional help in planning a ranch investment, contact personnel at the local Oklahoma Cooperative Extension Service office.

References and Resources by Discipline

Forage

Stocking Rate: The Key to Successful Livestock Production. OSU Facts F-2871.

Drought Management Strategies. OSU Facts F-2870.

Management Strategies for Rangeland and Introduced Pastures. OSU Facts F-2869.

Reducing Winter Feeding Costs. OSU Facts F-2570.

Stocking Rate: The Key to Successful Livestock Production. OSU Facts F-2871.

Tall Fescue in Oklahoma. OSU Facts F-2559.

Grazing Systems for Pastures. OSU Facts F-2567.

Forage-Budgeting Guidelines. OSU Facts F-2584.

Forage Legumes for Oklahoma. OSU Facts F-2585.

Bermudagrass for Grazing or Hay. OSU Facts F-2587.

Cool-season perennial grass update: OSU Dept. of Plant and Soil Sciences Production Technology 97-42.

Grazing systems for eastern Oklahoma: The Eastern Research Station example and future direction. OSU Dept. of Plant and Soil Sciences Production Technology 97-29.

Livestock production on land formerly enrolled in the CRP program. OSU Dept. of Plant and Soil Sciences Production Technology 97-23.

http://clay.agr.okstate.edu/extensio/extenshn.htm

Agricultural Economics

http://agweb.okstate.edu/pearl/agecon/agecon.htm for Fact Sheets and Current Reports

Legal Considerations in Organizing a Business in Oklahoma. OSU Facts F-175.

Effect of Selected Characteristics on the Sale Price of Feeder Cattle in Eastern Oklahoma. OSU bulletin E-955.

Cow/Calf Standardized Performance Analysis (SPA). OSU Facts F-222.

Cow/Calf Production and Financial Performance: What We are Learning from the Standardized Performance Analysis Data . OSU Facts F-231.

Interpreting Cow/Calf Standardized Performance Analyses. OSU Facts F- 232.

Developing a Cash Flow Plan. OSU Facts F-751.

Developing a Balance Sheet. OSU Facts F-752.

Developing an Income Statement. OSU Facts F-753.

Evaluating Financial Performance and Position. OSU Facts F-790.

Valuation of Raised Breeding Livestock. OSU Web Facts WF-323.

Schedule of Assets. OSU Web Facts WF-791.

Liabilities Schedule. OSU Web Facts WF-792.

Capital Leases. OSU Web Facts WF-935.

Consolidated Financial Statements. OSU Web Facts WF-937.

Owner Equity. OSU Web Facts WF-938.

Tax Consequences of Drought Sale of Livestock. OSU Current Report CR-788.

Estimating 1998 Income Taxes. OSU Current Report CR-942.

Farm financial management resources: http://www.agecon.okstate.edu/ffmr

Quicken materials for farm financial records: http://www.agecon.okstate.edu/quicken.htm

Enterprise Budgets: http://www.agecon.okstate.edu/Budgets/

Integrated Farm Financial Statements Software (IFFS): http://www.agecon.okstate.edu/IFFS/

Intensive Financial Management and Planning Support (IFMAPS): http://www.agecon.okstate.edu/IFMAPS/

Ag Policy Wrap-Up: http://www.agecon.okstate.edu/AgPolicy/

Oklahoma Market Viewpoints: http://www.agecon.okstate.edu/Market/

Troy Wilson and David Kohl. VCE Timely Topics (farm business management topics), Virginia Tech, August 1997. http://www.ext.vt.edu:4040/eis/owa/docdb.getcat?cat=tt-news-fmu

Animal Science & Veterinary Medicine

The Management Of Beef Cattle For Efficient Reproduction. OSU Bulletin E-869.

Calving Management. OSU Bulletin E-906.

Oklahoma Beef Cattle Manual – Third Edition. OSU Bulletin E-913.

Expected Progeny Difference: Part 1: Background on Breeding Value Estimation. OSU Facts F-3159.

Expected Progeny Difference: Part 2: Growth Trait EPDs. OSU Facts F-3160.

Expected Progeny Difference: Part 3: Maternal Trait EPDs. OSU Facts F-3161.

Expected Progeny Difference: Part 4: Use of EPDs. OSU Facts F-3162.

Beef Cow Herd Calendar. OSU Facts F-3261.

Cow-Calf Production Record Software. OSU Current Report CR-3279.

Disease Protection of Baby Calves. OSU Facts F-3358.

http://www.ansi.okstate.edu/
Breeds of Livestock
Livestock Library (Breed Associations, Livestock Associations, Industry Contacts)
Extension Publications and Extension Service Links
Computer Software
Research Reports and Highlights
Cow-Calf Corner

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