December 2001

Leasing Arrangements for Cattle

Richard T. Clark
University of Nebraska - Lincoln, rclark3@unl.edu

Duane Griffith
Montana State University, Bozeman, MT

Kevin Dhuyvetter
Kansas State University, Manhattan, KS

Damona Doye
Oklahoma State University, Stillwater, OK

Proceedings, The Range Beef Cow Symposium XVII
December 11, 12, and 13, 2001, Casper Wyoming

LEASING ARRANGEMENTS FOR CATTLE

Richard T. Clark, University of Nebraska, North Platte, NE
Duane Griffith, Montana State University, Bozeman, MT
Kevin Dhuyvetter, Kansas State University, Manhattan, KS
Damona Doye, Oklahoma State University, Stillwater, OK

INTRODUCTION

Agriculturists have long used leasing arrangements as a means of farming or ranching with more than owned resources. Most commonly, land has been leased, but other resources can be acquired in a similar manner. Beef cows are leased between parties on either a cash or share of calf crop basis, but share leases seem to be predominant. Bulls, when not part of a cow share agreement, are primarily leased for cash.

Leasing arrangements may be considered in several situations. Producers can use leases, calf share in particular, to transfer ownership of cows to others over time with possibly less income tax consequences compared to an outright sale. Individuals who are forced to liquidate cowherds may use leases as a means for re-establishing a herd without needing to borrow money for capital purchase. Producers who wish to establish new or expand existing cowherds could examine leasing as an alternative to raising or purchasing cows.

LEASE OR OWN COWS AND BULLS?

The decision whether to own or lease cows and bulls involves several factors in addition to cost comparison. Cost comparisons for an operator deciding whether to own (by purchasing or raising) or to lease, can usually ignore all costs for the cows except ownership and lease costs, provided that the cows to be leased are of similar size and quality to those to be raised or purchased. Comparing costs of raising cattle to leasing requires estimating the cost to raise a replacement heifer/bull to breeding, calving or other age depending on when she/he would enter the herd. Depending on feed costs and replacement purchase prices, raised replacements may cost more or less than purchased replacements.

Cost Comparison

To compare the costs of owning or leasing a cow, complete these three steps: 1) estimate ownership costs per year for purchased or raised cattle, 2) estimate bull ownership cost per year on a per cow basis, and 3) compare the ownership costs of the cow (including bull if appropriate) with the lease cost. Detail for each of these steps follows.

Step 1. Estimate ownership costs per year for purchased or raised cows or bulls.
a. Economic depreciation (D) is an expense claimed by the owner of a capital asset to

compensate for the asset wearing out over some limited useful life. Economic depreciation may differ from depreciation taken for tax purposes, as depreciation allowed by the Internal Revenue Service may differ from values used for management purposes. Any discussion of depreciation in the remainder of this article refers to economic depreciation. Depreciation estimated as part of cattle ownership costs is the difference between beginning value (BV) and ending (may be cull) value (CV) divided by expected years in herd (YH) or (BV-CV)/YH. For example, an $800 heifer with an expected cull value of $400 at the end of 8 years would have annual depreciation of $50 [($800 - $400) /8]. A $2000 bull with an $800 cull value and 4 years in the herd would have annual depreciation cost of $300. This method of calculating depreciation uses the standard economic approach, straight-line depreciation.

b. Interest on investment (I) is usually an opportunity cost on funds tied up in cow or bull ownership. Interest on investment in a cow or bull is the interest rate times the average value of the animal i.e. r x ((BV + CV)/2). In our example suppose we use 8 percent interest rate then I = r x ((BV + CV)/2 or 0.08 x $600 = $48.00/year for the cow and 0.08 x $1400 = $112/year for the bull.

c. Death loss (DL) is another cost of cow ownership. Death loss should be calculated on average value. If we estimate a 1 percent death loss then the cost for our example is $6/year for the cow [($800 + $400)/2 x 0.01] and $14/year for the bull [($2000 + $800)/2 x 0.01].

d. **Property tax** (PT) may be assessed against cow and bull values in some states. In such cases these taxes should be added to the ownership cost. For our example assume PT = 0.

e. Total ownership costs (TO) = D + I + DL + PT or in the example, $50 + 48 + 6 + 0 = $104/year for the cow. The annual ownership cost for the bull would be $300 + $112+ $14 + 0 = $426. Higher cow or bull values or interest rates or a shorter depreciation period will increase the cow and bull ownership costs.

Step 2. Estimate bull ownership costs per year per cow.
This is estimated by dividing the bull TO by female-to-bull ratio (number of heifers and cows per bull) for example $426/30 = $14.20/cow.

Step 3. Compare the cost of owning the cow with the cost of leasing a cow.
In situations where the bull is provided as part of the lease, add the bull ownership cost per cow to the ownership cost of the cow for comparison.

a. Cash lease. A cash lease for a cow (bull discussed later) is the easiest to compare to owning. In our example, we would compare the cash lease to $104/cow without bulls or $118.20/cow ($104 + $14.20) if bulls were provided. If the cash lease exceeds the $118.20 then we would be ahead to purchase the cows and appropriate number of bulls. However, our cash flow may not permit purchase and our lender may not be willing to loan us the amount to buy cows or bulls. In such a case, the lender may not approve a cash lease either because it would require a cash payment for use of the cows and bulls.

The conditions of the cash lease are important to the comparison. If the cow owner stands death loss and is willing to replace infirm and open cows for reasonable reasons, then

the comparison can be made straight forward and as described above. If, however, the cow owner expects payment for any death loss, then the amount of rental payment should be reduced by estimated death loss. If replacing open or infirm cows is the responsibility of the lessee, then those replacement costs will be borne by the lessee. The cash lease cost should be negotiated down depending on what is a reasonable expectation for replacement of open or infirm animals. Remember, the straight cash lease does not change during the year if prices go up or down. If calf prices go up the lessee is the primary beneficiary and the cow owner will not gain. On the other hand, if prices fall the cow owner is protected and the lessee will carry the burden of all reduced gross value of sales. In other words, production and price risk usually fall solely to the lessee with a cash lease.

b. Share leases may be a way to obtain the use of capital in the form of cows and/or bulls in situations where cash or credit is limited. These leases also permit the sharing of risk between the lessee and lessor. Just which risks are shared depends on how the lease is written. Comparing ownership to share leasing is more difficult than comparing to cash leasing. In most share lease arrangements the cows and bulls are furnished for a share of the calf crop. While all leases depend on negotiation between both parities, equitable lease arrangements usually share revenues in the same proportion as each party contributes to costs. For example, if the cow owner costs, as calculated above, were 30 percent of the total cost of production, she/he would receive 30 percent of shared revenue. A remaining issue is to determine what revenue is shared. Livestock leases will typically contain revenue from production (calf crop) and revenue from capital asset sales (cull cows and bulls). Both parties, as per the lease agreement, share revenue from production. As a general rule, the income from cull cows and bulls is not shared, however, there are exceptions to this rule. These difficulties are discussed in a later section on Cow-Share Leases, which follows.

Unlike cash leases, the cost of a share lease (value of the calves shared with cow owner) will change if the market goes up or down and if productivity of the cowherd changes. After determining cow ownership cost, the producer wishing to lease cows on a share basis must estimate the cost of leasing in terms that can be compared to costs of owning. To make this comparison for share leased cattle, requires estimation of calf weaning weights, weaned price, and number of weaned calves for the cows leased. Suppose weaned calves (males and females) are expected to average 450 pounds and bring $90/cwt. Due to open cows and calf losses the producer expects to wean 88 calves per 100 cows leased. The expected cost per cow leased is the share payment to the cow owner (assume 30 percent of calf crop for the example) times the net per cow leased. In the example, the net revenue per cow is 4.5 cwt. x $90/cwt. x 0.88 = $356.40. The cost per cow leased is $356.40 x 0.30 = $106.92 which is to be compared to the cost of owning the cow of $104 without a bull and $118.20 with bulls. The cow owner is sharing production and price risk with the lessee. That is, if production or calf price is below expectations, the rent goes down and if higher the rent goes up. In our example, it would cost more to lease the cows and bulls on this 30 percent to the cow-owner share lease than to own them based on comparing economic costs. If risk sharing is important and dollars to pay for purchasing or raising the cows are limited, then the producer still might decide on the share-lease.

Other considerations

Relative costs are important, but they are not the only consideration. Productivity and quality of the leased versus owned cattle should also be considered. Producers who have improved the genetic base of their herd may be reluctant to bring in leased cattle unless they can be assured the quality is similar. It is important to know as much as possible about the quality of leased cattle. One way of helping control quality is for the lessee to continue to provide his or her own bulls or AI service.

Income tax impacts (and in some states property taxes) may also be important. There may be income tax advantages to leasing or owning cattle depending on the producer's particular situation. We recommend that before entering into either a cash or share lease for cattle that producers discuss the tax implications with their tax advisers.

If property tax is charged on the cattle, that expense should be added to the ownership costs discussed above. If the producer chooses to own the cattle, then she/he will pay the property tax whereas if leased, the cow-owner will pay the tax.

If the share lease arrangement compares favorably to ownership costs it is probably equitable; however, testing a lease arrangement for equity will help both parties be more comfortable with the arrangement. A lease that strongly favors one party over the other is not likely to last in the long run. In the long run all parties should have the opportunity to profit from the lease; otherwise, it will lead to dissolution of the agreement.

COW-SHARE LEASE

Even if the cow-share lease turns out to compete economically with owning cows, producers should consider other points. Those who enter such agreements must realize that they are giving up some degree of control and management now might be shared.

What is equitable or fair?

Fairness is in the eyes of the "beholder." What may appear fair to one may not to another. The agreement must be fair in the eyes of **all** those agreeing to its terms if they are going to continue to do business together. While we may not be able to determine fairness, we can estimate the equity of an arrangement. If an agreement is equitable, it may be considered fair to the parties involved.

The common arrangement in an area is one way of judging equity. A survey of Nebraska Sandhills ranchers (Clark and Coady) found that the typical cow owner received between 30 to 40 percent of the calf crop. The cow owner usually furnished the bulls and replacement females. The rancher (lessee) provided the feed, labor, most management, and veterinary expenses.

Common, however, does not, necessarily, mean equitable. As indicated earlier, an equitable share arrangement, from an economic standpoint, is one in which returns are shared proportionally to the cost contributions of each party. In other words, if one party provides

35 percent of the cost of production, then that party should get 35 percent of the output. This method works reasonably well if risks associated with the agreement are ignored. Production and price risks of calves are usually shared; however, the cow owner usually bears price and death loss risks for cows unless the share agreement is updated when major changes in cattle values occur.

Determining relative cost contributions

The procedure for determining relative contributions of the contracting parties seems quite simple, but that can be misleading. The costs contributed by each party are added and then divided by the **total** costs. Determining the appropriate cost for various inputs is the more difficult part. For example, what is the value of a cow? The cow owner and lessee may or may not agree, but it is an important number for determining the cow owner's contribution. The rate of return the cow owner should receive is also an important determinant of the owner's costs and could be a point for discussion. The evaluation of the contributions by the lessee is also critical. Some resources, especially labor, can easily be double counted. Inputs such as hay and grazing should be valued at their opportunity cost. When this is done the contribution of labor and land is already valued so labor for hay harvesting, for example should not be counted again.

The terms of the lease affect how cost contributions are to be calculated. A full discussion of all possible factors that can affect a lease is beyond the scope of this paper. Leasing arrangements vary widely and one method for estimating some of these costs cannot be used across all possible lease arrangements. Two important issues are how economic depreciation (rather than tax depreciation) and interest (opportunity cost) are estimated and allocated between lessee and lessor. The lessee and lessor should carefully consider the conditions of their lease and make sure both parties use appropriate costs. General procedures that can be used to help estimate the more important and difficult costs are outlined below.

Breeding livestock are capital assets. However, while an individual cow wears out over its useful life, a **breeding herd** that is maintained through annual culling and replacements does not, assuming constant valuation of the same quantity/quality of breeding animals. At the end of the lease, the cow owner may get the capital asset (breeding herd) back in the same condition as at the beginning of the lease. Whether or not depreciation should be allowed as a cost of the cow owner in lease negotiations and for determining lease equity depends on the terms of the lease. The lease arrangement also affects the calculation of interest on investment and death loss when evaluating the equity of a share lease. We previously described calculating investment return and death loss for comparing ownership to a lease. Interest on investment for estimating equitable share leases may be calculated differently in some situations. To illustrate, three lease scenarios and their implications for depreciation and interest on investment, are discussed below. The mechanics of calculating depreciation are the same as already discussed.

Scenario 1. The quantity and quality of the cattle herd is maintained over time through timely insertions of replacements. The lease arrangement specifies that the cattle owner is

financially responsible for providing those replacement cattle. All calves are sold or divided between the parties each year at weaning. Since the lease requires the cow owner to maintain herd quantity/quality, economic depreciation can be used to estimate that cost. Because the quantity/quality of the herd is being maintained, interest on investment and death loss should be calculated using the beginning value, not the average value (see Table 1). Replacements can either be raised (calves and development costs need to be provided by lessor) or purchased from outside the herd. This is one of the more common lease arrangements.

Scenario 2. The quantity and quality of the **leased** cattle herd is **not** maintained over time. The lease specifies that no replacement heifers are kept from the calf crop or provided by the cow owner. The number of cattle covered by the lease will thus decline over time as animals are culled from the herd. This type of lease may be suitable for a relatively short-term lease with predominately young breeding animals. It also may be used to transfer ownership of the herd over some specific amount of time to the lessee who does supply the replacements. The lessee's supplied replacements then fall outside the lease agreement and are no longer relevant to the calculations for determining appropriate shares for the remaining cattle covered by the lease. The cow owner in this arrangement incurs an expense for the asset wearing out over the period of the lease. In this instance, the cattle owner is credited with depreciation as an expense on the cattle covered by the lease. Interest on investment and death loss is based on the average value of the herd since it is declining in quality (Table 1).

Scenario 3. The quantity and quality of the cattle herd is maintained by retaining replacements from the annual calf crop. Ownership of the entire breeding herd remains with the cow owner who will receive the herd back at the end of the lease in the same condition as the beginning. The owner may not incur any annual expense for developing the replacements. If the lessee pays all heifer development costs then the lessee's share of the total costs will be increased compared to the other two scenarios and the lessee would receive a larger share of calves or revenue. There will, however, be fewer calves shared since replacements are retained. Because herd quality and quantity are being maintained from within the herd, depreciation should not be used as a cost to either party. Cull income, however should be shared to help compensate both parties for the reduction in total calves available for sale. Interest on investment and death loss should be estimated from the beginning herd value since it is being maintained (Table1). This type of lease is cumbersome to set up and to evaluate for equity. We recommend that it not be used if possible.

This brief discussion is only to alert readers that cost calculations for a lease will vary a great deal. Table 1 summarizes the key points of these three scenarios. See references at the end of this article for a more detailed discussion of the process of valuing inputs and testing the equity of the agreement.

Table 1. Cattle-share lease scenarios and treatment of depreciation, return on investment and death loss.

Scenario ==>	1	2	3
Cowherd size, quality maintenance	Maintained over time through replacements added to herd [1]	Not maintained over time (number of cows and herd size decreases as aged cows are culled) [2]	Maintained over time through raised replacements from herd
Income from calves	Income from all calves is shared [3]	Income from all calves is shared	Income from all calves sold is shared (i.e., excludes replacement heifers)
Income from cull cattle to:	Cow owner	Cow owner	Shared
Cow replacement allowance (depreciation)	(BV-CV)/YH	(BV-CV)/YH	Not applicable
Credit depreciation to:	Cow owner	Cow owner	Neither party
Interest on average investment	BV x r	[(BV+CV)/2] x r	BV x r
Death losses to cow owner	BV x DL %	[(BV+CV)/2] x DL %	BV x DL %
Property tax	If appropriate	If appropriate	If appropriate

[1] Replacements can either be raised or purchased from outside of the herd, however, in both cases they are the financial responsibility of the cow owner.
[2] This type of lease is typically used when the ownership of the cowherd is being transferred from one party to another. Replacements that are added to the herd are the responsibility of the lessee and thus are not included in the lease.
[3] If replacements are held back from raised heifers, the cow owner needs to purchase the lessee's "share" of any heifers retained.

CASH LEASES FOR BULLS

Cost comparisons

Bulls may be leased separately from cows and, when this occurs, they are usually leased on a cash basis. A producer should compare the bull ownership costs as described above with the cash rental rate for the bulls. In addition, quality and health factors should be considered.

One major difference between bulls leased as part of a cow or calf share arrangement and bulls leased outright for cash pertains to the length of time for which a bull must be

cared. Bulls leased for cash are usually on the lessee's premises for only the length of the breeding season. This arrangement reduces the feed and care costs of the bull compared to owning the bull. The reduced feed and care costs should be estimated and used to reduce the lease cost when comparing to ownership. For example, if the bull is not around during the winter in the northern parts of the U.S., no hay or protein supplement will be needed so costs could be reduced easily by $100 per bull per year just through reduced feed.

The bull owner often replaces cash leased bulls if a bull is injured, dies or becomes unacceptable for some other reason. If the lessor has adequate bulls of the needed breed and quality, this type of replacement guarantee can be an important advantage. There may be tax advantages to leasing bulls so producers should consult their tax adviser.

Other considerations

Adding only virgin bulls to the bull battery for the cowherd is the safest from a health standpoint. When leasing bulls, this may not always be an option. Virgin bulls minimize the risk of introducing venereal diseases into the herd. The two common venereal diseases (spread by breeding) are vibriosis (campylobacteriosis) and trichomoniasis (trich). These diseases can reduce pregnancy rates by 20-30 percent and result in many late bred and open cows. Bulls four years old and older can become chronically infected with trich but it can also be found in younger bulls. Detecting trich is expensive and requires up to three tests of bulls per year to be assured they are not carriers. Vibriosis and other diseases can be controlled with a good vaccination program for both cows and bulls. Breeding soundness is another consideration. A bull breeding soundness examination should be done yearly, 1 to 2 months prior to the breeding season. The bull owner or leasing firm should provide this exam. The best advice is to discuss bull leasing with your veterinarian. He or she can contact the veterinarian in charge of the herd health of the bull owner or leasing firm to evaluate the herd health program and help you consider the pros and cons of bull leasing for your cowherd.

While health and economic issues are keys to the lease decision, other important questions should be considered. Are EPDs available for the leased bulls? Can you pick the bulls? Are appropriate breeds available year after year to match your breeding program?

SUMMARY

The decision as to whether to own or lease cattle requires estimating ownership and lease costs. Determining cash lease costs is reasonably straightforward. While cash leases are appealing because of their simplicity, they may involve considerable risk for the lessee. This is because rental payments are fixed regardless of production and price levels. Cash leases are not common for beef cowherds; however, they are the most common type of lease for bulls. Comparing ownership costs to share lease costs also is not extremely difficult if the terms of the share lease are known. Determining whether or not the share lease is equitable, however, is much more difficult and requires attention to lease conditions. While estimating the equitable terms for share leases is more complicated than cash leases, share leases provide a means for the cow owner and the producer to share production and price risks. Share leases have generally been the most common types of arrangements for beef cowherds.

REFERENCES AND OTHER SHARE LEASE SOURCES

Clark, Richard T. and Don Hudson. 1995. Cow-share and bull leasing arrangements: What's fair and economical? In: The Range Beef Cow Symposium XIV. Coop. Ext. Serv. and Animal Science Depts. Univ. of NE., CO. State Univ., SD State Univ. & the Univ. of WY. pp.237-246.

Clark, Richard T. and Sean A. Coady. 1993. Ranch management practices in the Sandhills of Nebraska: Managing the ranch business. Agric. Research Div., Univ. of Nebraska-Lincoln, RB 316.

Doye, Damona, Darrel Kletke and Nikki Coe. 2000. Breeding Livestock Lease Agreements, Oklahoma State University, WF-571. http://agweb.okstate.edu/pearl/agecon/resource/wf-571.pdf and spreadsheet at http://www.agecon.okstate.edu/software.htm

Erickson, Lorne, Merle Good and Bill Heidecker.1994. Negotiating cow lease arrangements. Alberta Ag, Food and Rural Development Publishing Branch, Edmonton, Alberta, Canada.

Fausett, Marvin R. and Kevin C. Dhuyvetter. 1995. Beef cow leasing arrangements. Kansas State Univ., Coop. Ext. Serv., MF-2163.

Griffith, Duane. 2000. Worksheet that can be used for estimating lease equity. Go to site and down load the CCFS file. http://www.montana.edu/wwwextec/software/software.htm

Hughes, Harlan, Dwight Aakre, and LaDon Johnson. 1994. Leasing beef cows for a profit. North Dakota State University, Extension Service.

Robb, James G., Daryl E. Ellis and Steven T. Nighswonger. 1989. Share Arrangements for Cow-calf or Cow-yearling Operation: COWSHARE A Spreadsheet Program. Nebraska Cooperative Extension, CP-2. University of Nebraska, Lincoln.