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## Evaluating the feasibility of beginning a cow/calf operation

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### ABSTRACT

An aging farm population, increasing demand for beef and lessening drought conditions suggest opportunities for new beef producers. However, high cow prices and land values may create barriers to entry. This paper evaluates leasing and purchasing options for both land and cows. Investment and operating cost assumptions are explained along with loan alternatives for beginning operators. Whole farm financial statements are generated and resulting net cash flow, line of credit and total debt levels are projected for five years. Leasing cows and land is found to be a viable means of entry. Only with outside income can cows be purchased; significant levels of outside income are needed to purchase land.

**KEYWORDS:** cow/calf; beginning; rancher; feasibility; cash flow

### 1. Introduction

For individuals interested in beginning beef cattle production in the U.S., now would seem to be an opportune time. An aging farmer population suggests that a new younger cohort of producers may be needed to take over farm/ranch operations. The cowherd remains near record low numbers at a time when more beef is needed to meet market demands. And multi-year drought conditions are easing in much of the country.

The average age of farm operators in the U.S. as well as Oklahoma is 58.3 years old according to the Census of Agriculture (USDA NASS 2014, Table 1). USDA's definition of a farm is a place that normally sells or produces agricultural products valued at \$1,000 or more in a year, encompassing many small and part-time operations. Further parsing of the statistics shows that of the Oklahoma producers who consider farming their primary occupation, half are over age 65 and another 25% are 55-64 years of age; thus three-quarters are at or near what might be considered retirement age. U.S. statistics are not quite as stark; 40.7 percent are over age 65 and 27.5 percent are 55-64 years old so 68 percent are retirement age.

Because the Oklahoma land base is largely pasture, beef is consistently the top ranked agricultural commodity, accounting for one-third or more of the value of production. Census of Agriculture data shows 44,000 beef cow operations, ranking third in the nation. In Oklahoma, more than half of beef producers have fewer than 50 head and more than 3/4 have fewer than 100 head (USDA NASS 2014, Table 16). Producers with fewer than 100 head account for about 1/4 of the cattle inventory; 47 large producers with more than 1,000 head also account for 1/4 of the cattle inventory. The average beef cow herd in Oklahoma in 2012 was 38 head; average herd

size from 1987-2012 varied from 38 to 44 head (USDA NASS various issues). The average U.S. beef cow herd during that same time period varied from 40 to 43, also with the low in 2012 (USDA NASS, various issues). Data comparing the profitability of beef cow/calf operations by size is limited. The FINBIN Farm Financial Database which is populated largely by Midwest farms shows that from 2010-2014, net returns over labour and management were lowest for small operations with 50 or fewer cows and highest for operations with 201 to 500 cows (University of Minnesota 2015).

Successive years of drought in Oklahoma have shrunk the size of the cowherd at the same time that the U.S. cowherd is at a historic low in terms of numbers. With drought conditions possibly improving and markets signalling the need to rebuild the cowherd, a question arises as to the financial feasibility of adding new herds, particularly by beginning operators. But rising land values and the cost of breeding livestock make an investment in beef production costly. With high capital costs for land and livestock, gaining control of assets poses challenges for beginning producers with limited equity and experience.

Leasing land is a well-established practice as many farm operators lease some land and some lease all their land. Approximately two-thirds (67.7 percent) of farm principal operators are full owners of their farm, 25.3 percent are part-owners and 7 percent do not own land (USDA NASS 2014, Table 70). Leasing assets is often a viable alternative for a beginning producer because it requires less capital, allowing working capital to be directed to operating costs rather than debt payments, and lessens exposure to risk.

The objective of this research is to evaluate the feasibility of purchasing and leasing cows and land as alternatives for

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a beginning beef cattle producer. We summarize costs of establishing and maintaining a beef herd, identify different borrowing options, then estimate the resulting cash flow associated with different scenarios. We evaluate alternative financing arrangements for land and cattle to inform prospective industry entrants about the financial needs associated with beginning a beef operation.

**Cow/calf herd establishment costs**

In this analysis, we focus on native range as a forage base. In Oklahoma, opportunities exist to purchase or rent both native range and introduced pasture. Native range is typically the most cost effective means of maintaining cattle with rents of approximately \$6 per hectare (\$15 per acre) (Doye and Sahs 2015). Native pastureland is also less expensive to buy as land on which introduced pasture is grown is often suitable for crops with higher returns per hectare than livestock enterprises. In Oklahoma, pastureland prices currently average approximately \$3,707 per hectare (\$1,500 per acre) (agecon.okstate.edu/oklandvalues).

We assume the goal is to establish a small herd of cows similar in size to the average Oklahoma herd size of 35 cows. For this analysis, each cow requires approximately 4 hectares of native pasture (10 acres) for maintenance so the required landbase is 142 hectares (350 acres). Table 1 summarizes the assets presumed to be used in the operation. Equipment includes feed bunks, loading squeeze chutes, round bale feeders and portable corral. While a small tractor is not required, and in fact, would be discouraged from a cost perspective, many small producers do choose to buy one. The investment needed to establish even a small herd of 35 cows is substantial, ranging from approximately \$60,000 to more than \$682,000 depending on whether land and cattle are purchased or leased.

Purchasing land increases the investment needed dramatically. Costs associated with controlling the land base, whether land is purchased or rented, are significant. Renting land typically presents less of a cash flow burden than buying land and is more profitable in the short run. However, land purchases can result in growth in equity if land values appreciate over time and thus be a good long term investment. Hence, we evaluate both options.

**Cow/calf operating costs**

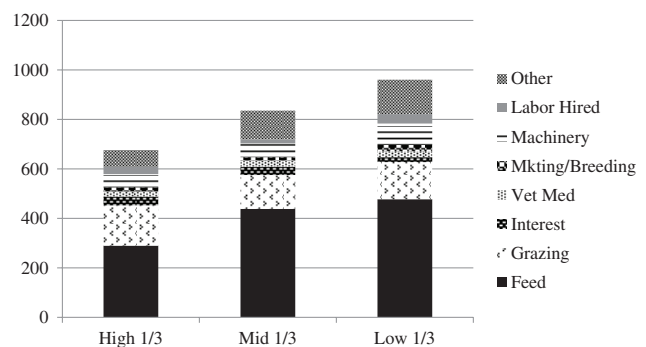
Although beef production is the most prevalent enterprise in Oklahoma, profitability is certainly not guaranteed and poses difficulties, particularly for a young producer starting with a smaller herd. Because Oklahoma does not have a database of actual ranch costs, we frequently benchmark

budget data to Kansas Farm Management Association (KFMA) and Standardized Performance Analysis (SPA) data. KFMA average variable cost per cow in 2013 was \$772 per cow and the difference between the high- and low-profit category KFMA producers is approximately \$466 per cow (Figure 1). The southwest SPA summary includes some Oklahoma herds but is primarily Texas based (Bever 2015). SPA data for 2009-13 show an average raised/purchased feed cost of \$200 per cow and grazing cost of \$107 per cow, with total financial cost of \$705 per cow. Oklahoma grazing and feed costs for native pasture based systems are expected to be more similar to Texas than Kansas.

Table 2 shows the operating cost assumptions used in this analysis. The numbers are generated by Oklahoma State University (OSU) 2014 enterprise budget software (agecon.okstate.edu/budgets). This budget includes only 30 days of hay fed so projected operating expenses presume managers appropriately stock cattle to minimize purchased feed and hay. In addition, no cash labour costs are included as it is assumed labour, an estimated 6.9 hours per cow per year, will be provided by the farm family. We presume the beginning operator will be an efficient, low cost producer.

**Whole farm financial plans**

Whole farm financial plans to compare the alternative scenarios are generated using OSU Integrated Farm Financial Statements (IFFS) software (Doye, Petermann and Haefner 2000). In IFFS, cash shortfalls accumulate in the line of credit balance. The plans are based on a 35 head herd of moderate framed cows along with 1 breeding bull. Production assumptions are listed in Table 3. In the purchased cow scenarios, a cow/calf pair is initially purchased for \$2,800 and bull for \$3,600.



**Figure 1:** 2013 Variable cost of production by profit category (\$/cow), Kansas Farm Management Association

**Table 1:** Cow/calf herd assets included with different asset control strategies

	Buy Land, Buy Cattle	Buy Land, Lease Cattle	Rent Land, Buy Cattle	Rent Land, Lease Cattle
Land: \$3,707/ha (\$1,500/a)	\$525,000	\$525,000		
Cows: \$2,800/pair	\$98,000		\$98,000	
Bull	\$3,600		\$3,600	
Vehicle & trailer	\$23,500	\$23,500	\$23,500	\$23,500
Equipment	\$15,250	\$15,250	\$15,250	\$15,250
Supplies	\$2,000	\$2,000	\$2,000	\$2,000
Tractor	\$15,000	\$15,000	\$15,000	\$15,000
<b>Total</b>	<b>\$682,350</b>	<b>\$580,750</b>	<b>\$157,350</b>	<b>\$55,750</b>

**Table 2:** Operating input costs for 35 cows on native pasture

Operating Inputs		Price	\$	Total	\$	Head
Pasture (rental)	\$	150.00/head	\$	5,250	\$	150.00
Hay	\$	32.55/head	\$	1,139	\$	32.55
Protein Supplement	\$	63.22/head	\$	2,213	\$	63.22
Minerals & Salt	\$	12.13/head	\$	425	\$	12.13
Vet Services/Medicine	\$	5.77/head	\$	202	\$	5.77
Vet Supplies	\$	14.86/head	\$	520	\$	14.86
Marketing	\$	8.22/head	\$	288	\$	8.22
Mach/Equip Fuel, Lube, Repairs	\$	147.71/head	\$	5,170	\$	147.71
<b>Total Operating Costs</b>			<b>\$</b>	<b>15,206</b>	<b>\$</b>	<b>434.46</b>

Future calf and cull animal prices are important in determining the profitability of the enterprise. Table 4 shows projected calf and cull prices (Peel 2015).

### Alternative financing scenarios for establishing a 35 cow operation

In the U.S., financing of agricultural operations is primarily done by commercial banks, Farm Credit Services (a co-operative entity with quasi-governmental status), and private individuals. A USDA Economic Research Service report noted that these three groups held 95 percent of the debt outstanding at year-end as reported by farm operators for their businesses (Harris *et al.*, 2009). USDA's Farm Service Agency (FSA) guarantees many commercial loans and also makes some supervised direct loans to producers, primarily to beginning or socially disadvantaged farmers, who have been turned down for loans from commercial sources (www.usda.fsa.gov). FSA loan programs for which beginning farmers are eligible include a down payment program (DP), farm ownership loans (FO), joint financing arrangements, land contract guarantees, micro-loans and direct operating loans (OL). Beginning farmers

generally receive preferential terms. Commercial lenders, both FCS institutions and agricultural banks, while interested in lending to younger and beginning operators typically do not offer concessionary programs. FSA loan program parameters are summarized in Table 5.

A total of 8 scenarios are evaluated: rent 142 hectares (350 acres) with either purchased or leased cows; purchase 81 hectares (200 acres) with an FSA FO loan and rent 61 hectares (150 acres); purchase 142 hectares (350 acres) using an FSA DP loan with purchased or leased cows; and purchase 142 hectares (350 acres) from a commercial lender with purchased or leased cows. In all cases, the beginning producer is assumed to be eligible for the FSA OL for financing operating inputs. Loan terms and associated cash flow parameters for our analysis are noted in Table 6. Commercial loan terms were based on an informal survey of several lenders. A presumed difference in scenarios is that the borrower has sufficient savings for the appropriate down payment.

Livestock leasing is much less prevalent than land leasing. Arrangements can be either cash or share leases. For the cow owner, leasing can generate income while reducing labour requirements. A cash lease provides fixed income for the cow owner, often on a per cow basis, with the cow operator incurring production risk. With a share lease, the cow operator may benefit from favourable production while the cow owner and operator share production risk and production decisions, which may complicate management. The leasing arrangement can be crafted to meet the goals of the cow owner and cow operator. One of the biggest decisions in a lease agreement is who is responsible for replacement livestock. Data shows producers cull around 14-15% of their cow herd each year (USDA APHIS 2012). The cow owner can be completely responsible for providing replacements; however, ownership of the cow herd does not shift over time in this arrangement. This type of agreement may be preferable if the cow operator wants to save money earned from the enterprise for purposes other than building a share of the herd or if the cow owner wants to stay engaged in the operation. Here, we

**Table 3:** Production parameters

Production and price assumptions	
Cow weight	499 kg (1,100#)
Bull weight	794 kg (1,750#)
Weaned heifer weight	220 kg (486#)
Weaned steer weight	235 kg (519#)
Replacement heifer weight	374 kg (825#)
Protein supplement (lb/hd/day)	
Cows	.68 kg (1.5#), 150 days
Weaned heifers (Oct-Dec)	.68 kg (1.5#), 45 days
Bred heifers	.68 kg (1.5#), 150 days
Prairie hay (lb/hd/day)	
Cows	\$82.69/T (\$75/ton)
Weaned heifers (Oct-Dec)	10.9 kg (24#), 30 days
Bred heifers	5.9 kg (13#), 10 days
	8.6 kg (19#), 30 days
Minerals	0.05 kg (0.12#)/hd/day
Labor	6.9 hours/head

**Table 4:** Livestock price assumptions

	Year 1	Year 2	Year 3	Year 4	Year 5
Steers, 5/6 cwt, \$/kg (\$/cwt)	1.1 (243)	1.25 (275)	1.25 (276)	1.72 (268)	1.18 (260)
Heifers, 5/6 cwt, \$/kg (\$/cwt)	0.99 (219)	1.12 (248)	1.13 (249)	1.10 (243)	1.07 (235)
Cull cows, \$/kg (\$/cwt)	0.53 (118)	0.57 (126)	0.56 (124)	0.54 (119)	0.52 (115)
Cow/calf pair, \$	2,800	3,300			
Bull, \$/head			4,125		

**Table 5:** Farm service agency loan programs for which beginning farmers are eligible

Loan type	Term (years)	Interest rate	Down payment	Maximum loan
FSA Down Payment	20	1.5%	5%	The lesser of 45% of price, appraised value or \$300,000
FSA Farm Ownership	Up to 40	4%	None	\$300,000
FSA Joint Financing	Up to 40	2% less than FO or 2.5%	None	50% by FSA
FSA Direct Operating Loan	1-7	2.625%	0	\$300,000
FSA Microloan	1-7	2.625%	0	\$50,000

**Table 6:** Loan cash flow

Loan Type	Years	Interest rate	Down payment	Annual Payment
FSA Down Payment (142 ha, 350 a)	20 for FSA portion, 30 for remainder	1.5% for FSA, 6% for remainder	5% = \$26,250	\$32,831
FSA Farm Ownership (81 ha, 200 a)	40	4.0%	0	\$15,157
Commercial (142 ha, 350 a)	30	6%	20% = \$105,000	\$30,513
FSA Direct Operating	7	2.625%		\$21,498 with cows, \$5,420 without cows

**Table 7:** Plan for building the cow herd using leased cows

Leased Livestock	Year 1	Year 2	Year 3	Year 4	Year 5
Cow/calf	35	35	28	21	14
<b>Beginning Operator's Owned Livestock</b>					
Replacement heifers	9	9	9	9	9
Bred heifers		7	7	7	7
Cows			7	14	21

**Table 8:** Net Cash flow available for new investment and risk with leased cows and leased pasture

	Year 1	Year 2	Year 3	Year 4	Year 5
Calf sales	14,965	16,983	19,774	21,916	23,865
+ Cull sales			3,200	3,200	3,200
- Cash expense	12,324	15,624	16,626	16,891	17,164
- Capital purchases	34,250				
+ New borrowing	34,250				
- Debt service		5,420	5,420	5,420	5,420
- Operating interest	397	660	803	793	559
Net cash flow	2,244	(4,720)	125	2,012	3,921

assume replacement females will be retained and raised by the cow operator to build ownership in a cowherd.

Using the Beef Cow Lease Calculator, an equitable lease agreement is estimated to be a 0.67:0.33 share lease if all labour and inputs are provided by the cow operator and cows are initially provided by the cow owner (Dhuyvetter and Doye, 2013). Table 7 shows the cowherd ownership transfer in the leased cow scenario with the livestock operator raising replacement females as allowed over time. As the cowherd ownership share for the cow operator increases, the operator provides more replacements and further grows ownership in the cow herd.

## 2. Results

The cash generated from calf and cull sales for the operation is significantly different during the five year projection horizon for leased and purchase cow scenarios (Tables 8 and 9). With leased cows, the cow operator has only a share of the calf crop and in addition is saving females for replacement heifers, leading to few calves to be

sold. As the cow operator initially owns no cows, there are no cull sales in early years. Cash expenses for operating inputs for the leased cows are the same as those for purchased cows within a given scenario, except for taxes and insurance on owned cows. Excluding debt service, cash expenses are higher in scenarios with land rent (plus a small amount of additional operating interest expense). However, total cash outflows with land debt repayment are significantly higher than leased land scenarios. Highlighting the estimated debt service requirements and cash available to service debt makes apparent that the beginning producer will have a difficult time servicing debt without significant income from other sources.

The lease pasture and cows scenario shows growing positive cash returns to labour and management after three years when saved replacement heifers begin to generate income through calf sales. While the income is small, these returns can be used for herd expansion, farm business or off-farm investments, or applied to family living expenses. This alternative may work well for producers who are unable to borrow money for livestock purchases or prefer to minimize debt. The cow operator

**Table 9:** Net cash flow available for new investment and risk with purchased cows and pasture purchased using a commercial Loan

	Year 1	Year 2	Year 3	Year 4	Year 5
Calf sales	29,086	30,993	31,020	30,161	29,236
+ Cull sales	1,298	9,702	15,093	12,363	12,055
- Cash expense	10,775	14,461	14,491	14,498	14,483
- Capital purchases	555,850	3,300	4,125		
+ New borrowing	555,850				
- Debt service		52,010	52,010	52,010	52,010
- Operating interest	300	1,880	3,308	5,116	7,008
Net cash flow	19,309	(30,956)	(27,821)	(29,099)	(32,210)

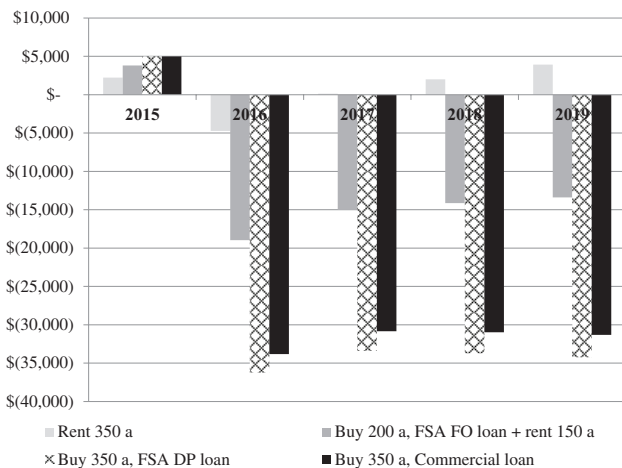
builds equity and collateral as herd ownership grows. In seven years, the cow operator has fully transitioned to owning a 35 cow herd.

In other scenarios where cattle and land or both are purchased with borrowed money, sales are generally sufficient to cover cash operating expenses and contribute to either land or cattle loan payments; however, the income generated is generally not enough to cover all of the cattle loan payments and certainly not enough to cover all land payments. Hence, an off-farm job or outside income is necessary to meet loan obligations and avoid rolling over the line of credit. Figures 2 and 3 compare net cash flow for different land control alternatives. The pattern intra-year is similar between the two but with a different scale.

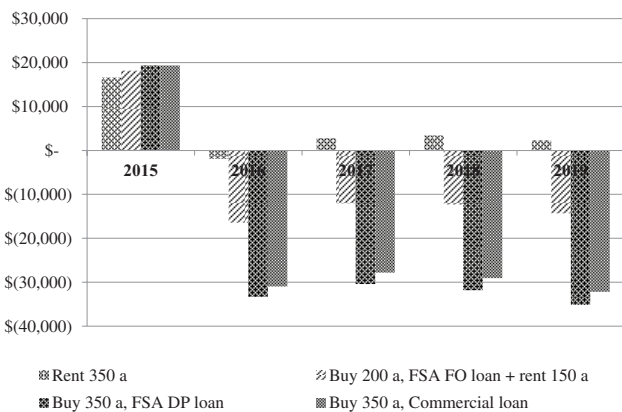
Because of the limited cash generated, leasing cows while purchasing land is not a good combination in early years; over time, however as cow ownership increases without associated cow debt, cows help with cash flow and reduce net cash shortfalls. Cash flow improves over time in the land control alternatives with leased cows (Figure 2); on the other hand, the debt burden with both purchased cows and purchased land does not allow for much improvement until cows are paid for after 7 years. This becomes more transparent when the operating line of credit end-of-year balance representing outside income or borrowing capacity needed to pay operating expenses and make loan payments is compared for different scenarios (Figure 4). Higher credit line balances are needed in purchased cow scenarios for a given land control scenario.

The net cash flow associated with buying 350 acres with an FSA DP loan and a commercial loan is similar. Recall that a significantly larger down payment is required for the commercial loan (\$105,000 compared to \$26,250) and the average interest rate is higher. But, the term is shorter on the FSA DP portion of the borrowing resulting in a higher average loan payment and worse cash flow consequences.

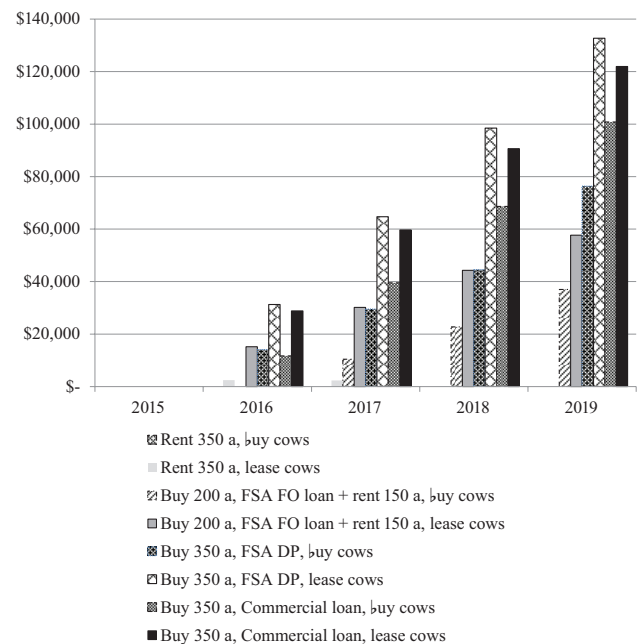
In Figure 5, total debt over time is plotted to provide a visual of the debt levels associated with different scenarios and the changes over time. Buying 350 acres of land commits the producer to high levels of debt for



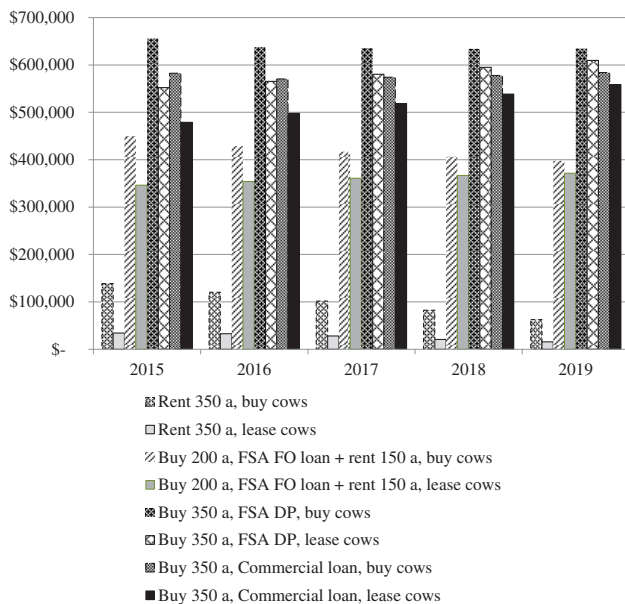
**Figure 2:** Net cash flow with alternative land controls and leased cows



**Figure 3:** Net cash flow with alternative land controls and purchased cows



**Figure 4:** Line of credit balance for different scenarios



**Figure 5:** Total debt associated with different scenarios

decades but builds equity over time if the ranch is profitable and/or land values appreciate.

### 3. Summary and conclusions

With each Census of Agriculture, concerns are voiced about the aging farm population and the repercussions of few young farmers entering the profession. High calf prices, low cowherd numbers, growing market opportunities, and lessening drought conditions seemingly point to profit opportunities for new livestock producers. However, finding financially feasible means of entry remains a challenge. Leasing cows and land for beginning producers is a promising proposition. Producers who are short on cash for a down payment or are not credit worthy may consider leasing cows and land as a way to enter ranching. The cow operator builds equity and collateral as ownership in the cowherd grows. Leasing cows is a financially feasible, if slow, path to cow ownership. However, if income is available from other sources, purchasing cows may be preferred. A beginning producer with excellent management skills and low costs of production may be able to generate sufficient cash flow to cover operating expenses and contribute to loan repayment. But, making land payments will require significant off-farm income. This research provides insights for beginning producers, extension educators, and lenders regarding the possibilities and challenges to entry that beginning producers face in establishing cow herds.

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