

## The Oklahoma Cooperative Extension Service WE ARE OKLAHOMA

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.



## A Strategy for Building a Beef Cow Herd

### EXTENSION

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expenses, owning the 29 heifers debt free. Replicating the process, the producer can build a herd of 100 cows in about four years.

In ShalekBriski et al. (2021), this strategy using calf prices, cull cow prices, feed prices and pasture rental rates for Oklahoma was analyzed. Data from 2003-2019 were used. The production assumptions and production costs are summarized in Tables 1 and 2. Oklahoma budgets resulted in positive net cash flows and net returns for 13 of the 14 cycles, which is summarized in Table 3. Feed costs were approximated using

**Table 1. Production Assumptions\***

<b>Phase I</b>	
Heifer Weight at Purchase	450 pounds
Heifer Age at Purchase	205 days
Death Loss	0.50%
Percent of Initial Heifer Purchase Financed	100%
Interest Rate of Financed Initial Heifer Purchase	6%
Age at Breeding	450 days
Age at First Cull	570 days
Cull Rate	15%
Weight at First Cull	810 pounds
<b>Phase II</b>	
Age at Calving	733 days
Weaning Percentage	98%
Calf Age at Weaning	205 days
Weaning Weight: Steer Calves	450 pounds
Weaning Weight: Heifer Calves	425 pounds
Cow Rebred Age	833 days
Cull Open Cows Age	938 days
Weight of Culled Open Cows	1,180 pounds
<b>Phase III</b>	
Conception Percentage	85%
Age of Bred "Twos-coming-Threes" when sold	1,028 days
Weight of Bred "Twos-coming-Threes" when sold	1,270 pounds
Assumptions for All Phases	
Percentage of Operating Expenses Financed	75%
Interest Rate of Operating Expenses Financed	5%

Building a beef cow herd is challenging for beginning and younger cow-calf producers due to the intensive capital requirements and approximate 27-month lag between the initial purchase of heifers and the sale of a calf crop. A three-phase herd-building strategy and summarization of the results of an economic analysis of the strategy for the Oklahoma cattle market are described below.

In Phase I, the producer borrows the necessary funds to purchase 100 weaned heifers in this example. (Alternatively, bred heifers could be purchased to shorten the time to calf sales, but at a higher initial cash outlay.) The weaned heifers are placed on pasture and bred at around 14 months to 15 months of age. Open heifers are sold as feeder heifers and the revenue is used to pay down debt, as well as feed and veterinary expenses. In Phase II, heifers calve around 24 months of age and calves are weaned with 70% of heifer calves retained as breeding stock. Steer calves and remaining heifer calves are sold. In Phase III, cows are rebred three months after their first calving and sold about four months later. As second-calf heifers ("two-coming-threes"), they are at their highest market value. It is assumed open cows are culled at cull cow prices.<sup>1</sup> By selling weaned steer and heifer calves, rebred cows and culled cows, sufficient cash may be generated to repay debt incurred for the initial heifer purchase and operating expenses. At the end of Phase III, the producers retains part of the heifer crop—approximately 29 head. In most years, the producer has paid off all debt and operating

<sup>1</sup> This is a conservative assumption as the culled cows are under 30 months of age and qualify as "Grade A" beef.

\*Source: ShalekBriski et al. (2020)

**Table 2. Production costs (\$ per head)\***

<b>Phase I</b>	
Feed Expense: Pre-breeding	250d
Veterinary and Medical Expense: Pre-breeding	\$15
Breeding Cost	\$25
Feed Expense: Gestation	283d
Veterinary and Medical Expense: Gestation	\$5
<b>Phase II</b>	
Feed Expense: Lactation, Rebreeding and Post-Lactation	205d
Veterinary and Medical Expense: Lactation, Rebreeding and Post-Lactation	\$15
Breeding Cost	\$25
<b>Phase III</b>	
Feed Expense: Bred Cows Post Weaning	90d
Open Cows Post Weaning	7d
Veterinary and Medical Expense	\$5

\*Source: ShalekBriski et al. (2021)

CowCulator (Lalman and Gill, 2017), feed prices and pasture rental rates varying by year.

Results are encouraging for most cycles except for the 2014 cycle. If heifer calves were purchased in fall 2014, net cash flow was projected to be negative as feeder calf prices in 2014 were abnormally high. Conversely, cattle prices were lower in 2016 when the steers and heifers from the 2014-purchased heifers were sold. This resulted in negative cash flows for the fall 2014 cycle.

The abnormally high calf prices in fall 2014 resulted in high net cash flows and net returns for the cycles beginning in 2012 and 2013. Initial heifer purchases were at lower prices relative to 2014 prices. Sales of calves, rebred cows and cull cows from the 2012 cycle were made in fall 2014, resulting in extremely high returns for the 2012 cycle. The 2013 cycle sold cull heifers as feeder heifers into the fall 2014 market, also resulting in high net cash flow and returns.

Sensitivity analyses were used to evaluate the robustness of the strategy to decreases in herd revenues and increases

in heifer purchase cost and operating expenses. The resulting net cash flows and net returns also are reported in Table 3. Revenues were decreased by 10% and 25%. At the 10% revenue reduction level, the strategy is projected to have positive net cash flows and net returns 10 and 13 cycles of the 14 cycles. At the lowest revenue level, just 75% of baseline, the strategy is projected to have positive net cash flows and net returns eight of the 14 cycles. Similarly, all costs were increased by 10% and 25%. Net cash flows and net returns are slightly less sensitive to cost increases than to revenue decreases. A 10% increase in costs had projected positive net cash flows and net returns 10 and 13 cycles of the 14 cycles. A 25% increase in costs had projected positive net cash flows and net returns eight and nine cycles, respectively, of the 14 cycles evaluated.

Along with the high capital outlays and long-term lags, beginning cow-calf producers face other difficulties, such as land acquisition, student loan debt and knowledge to efficiently

run the operation. However, the results of this strategy are encouraging. The timing of purchases relative to large price swings results in either large positive (if bought low and sold high) or negative (if bought high and sold low) net cash flows and net returns. In more “typical” years, building a herd for a first-time cow-calf producer seems financially feasible. Operating debt is incurred but can be paid down through selling cull heifers, steer calves and open cows. However, individual producers should work with county Extension educators and agricultural lenders to evaluate their personal situation before investing in breeding heifers.

**References**

ShalekBriski, A. E.A. DeVuyst, C.S. DeVuyst, R.Sahs, M. Stockton and K. Ramy. “Financing Beef Cow Herd Building for Beginning Ranchers,” *Journal of Applied Farm Economics*, 2021 (forthcoming).

**Table 3. Baseline and sensitivity of net cash flow (top) and net return (bottom) due to reduced revenue and increased cost.**

Year	Revenue as % of baseline			Cost as % of baseline	
	Baseline (100%)	90%	75%	110%	125%
2003	\$38,963	\$26,038	\$6,651	\$29,934	\$16,392
2004	\$54,594	\$40,106	\$18,374	\$45,565	\$32,023
2005	\$11,956	\$30	-\$17,859	\$1,225	-\$14,870
2006	\$25,876	\$12,528	-\$7,419	\$15,145	-\$950
2007	\$19,132	\$6,914	-\$11,414	\$8,827	-\$6,631
2008	\$33,139	\$19,520	-\$908	\$22,834	\$7,376
2009	\$7,181	-\$2,629	-\$19,141	-\$2,629	-\$17,345
2010	\$19,999	\$10,189	-\$9,527	\$10,189	-\$4,527
2011	\$326	-\$9,552	-\$24,370	-\$9,552	-\$24,370
2012	\$12,361	\$1,279	-\$15,344	\$1,279	-\$15,344
2013	\$39,147	\$29,782	\$15,735	\$28,782	\$15,735
2014	\$53,270	\$42,493	\$26,327	\$42,493	\$26,327
2015	\$55,004	\$15,373	\$12,881	\$45,598	\$31,490
2016	\$72,085	\$55,471	\$30,550	\$60,971	\$44,301
2017	\$55,070	\$37,437	\$10,987	\$42,944	\$24,754
2018	\$74,210	\$54,663	\$25,342	\$60,170	\$39,019
2019	\$69,732	\$50,813	\$22,436	\$57,787	\$39,869
2020	\$91,917	\$70,780	\$39,075	\$77,753	\$56,508
2021	\$126,118	\$96,624	\$52,383	\$109,236	\$83,912
2022	\$162,136	\$129,040	\$79,396	\$141,652	\$110,926
2023	\$90,159	\$67,444	\$33,372	\$76,460	\$55,912
2024	\$118,231	\$92,790	\$54,426	\$101,725	\$79,966
2025	-\$24,508	-\$41,008	-\$65,649	-\$43,466	-\$71,794
2026	-\$9,026	-\$27,018	-\$53,991	-\$29,476	-\$60,136
2027	\$3,032	-\$12,522	-\$35,853	-\$12,219	-\$35,095
2028	\$22,636	\$5,122	-\$21,150	\$5,425	-\$20,392
2029	\$38,695	\$23,637	\$1,049	\$27,506	\$10,723
2030	\$57,777	\$40,811	\$15,361	\$44,680	\$25,034
Cash flow≥0	13 years*	10 years	8 years	10 years	8 years
Net return≥0	13 years	13 years	8 years	13 years	9 years

\* Number of years (out of 14 simulated) with positive net cash flows (top) and net returns (bottom).