

Replacements — How High is Too High?

The unique answer for each operation depends on lots of factors and pencil pushing.

by *Wes Ishmael*

Rebuilding herds thinned by drought is on the minds of many producers, but that's about all. Drought has improved in many parts of the country but persisted and intensified in others.

“We want to be excited about the opportunity to rebuild as an industry, but I'm not convinced we're beyond the drought, especially in the southern half of the Great Plains,” says Rick Machen, the Paul C. Genho Endowed Chair in Ranch Management and interim director at the King Ranch Institute for Ranch Management, Kingsville, Texas. “The worst thing we could do is jump out and pay high prices for replacements and then not have the forage to support them.”

Put another way, Lee Schulz, Iowa State University (ISU) Extension livestock economist, believes the industry is at least one year away — maybe two — from full-fledged national herd expansion, assuming the current drought ends.

“Resource managers can proclaim the drought broken when soil moisture has been restored and forages have recovered to the point that they can tolerate grazing and continue their recovery,” Machen says. “How quickly this process can unfold is largely dependent on how well the resources (soil and plants) were managed prior to and during the drought. Aggressive or excessive grazing prior to the drought accelerated drought onset and its progression. Build drought resilience into your annual grazing management plan.”

Plus, Schulz explains, producers respond to profits rather than prices. By that measure, calves this fall likely represent the first profit many producers have seen in years.

“Profit means different things to different people in different situations,” Schulz says. For instance, he explains one profit calculation is defined by the money left after a business pays all costs. Producers must consider this calculation when making investment or expansion decisions.

Another one views profit as the return above variable expenses, which can help guide short-term decisions on production levels.

Running the numbers

When the opportunity does arrive for expansion, the likely sky-high prices for replacement females demand the sharpest of pencils as producers ferret out how much is too much to pay.

“There's not a universal answer because of the diversity of financial goals and objectives for those who run cows,” Machen says.

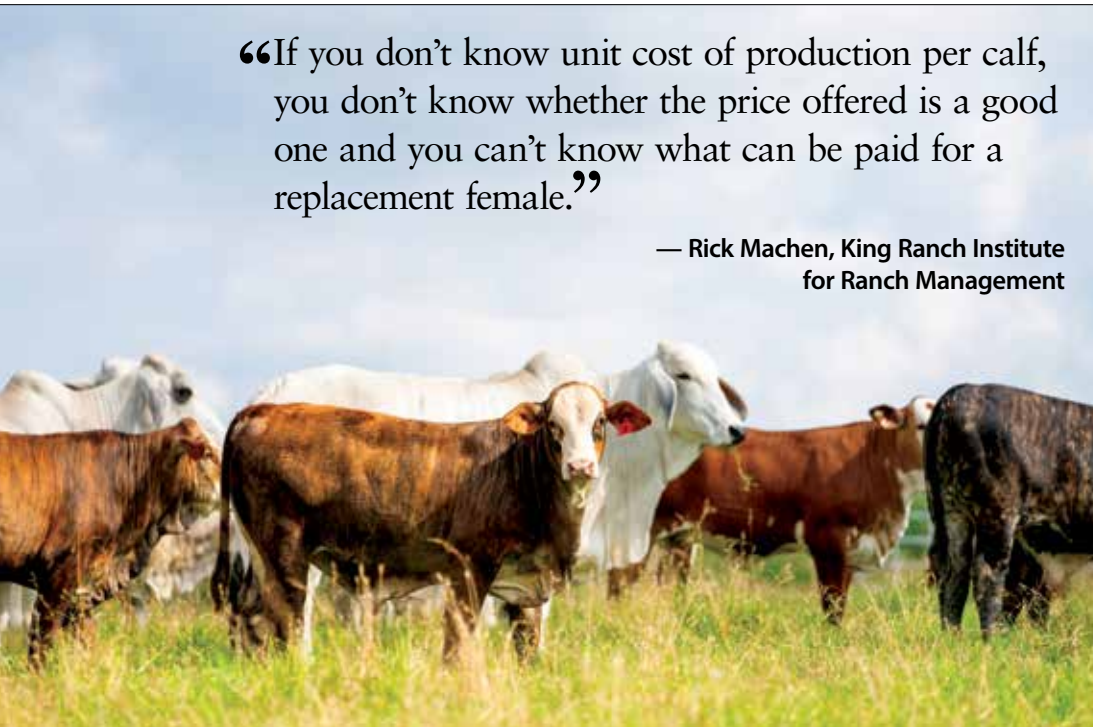
However, there are some age-old factors that should be part of the determination.

In broad terms, Elliott Dennis, University of Nebraska-Lincoln Extension livestock economist, explains that finding the appropriate price level depends on individual producers' expectations of current and future market conditions.

“These market conditions generally include animal productivity, calf prices,
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— Rick Machen, King Ranch Institute
for Ranch Management



Replacement Value Factors

Elliott Dennis, University of Nebraska-Lincoln Extension livestock economist, provided the following guidance in a recent issue of *In the Cattle Markets* from the Livestock Marketing Information Center.

Productive life — Each cow has a useful or productive life — some are long, and some are short. The longer she lives, the more value she has. This productive life has a direct tie to the cull rates of the whole herd. While cull rates vary by year and age of cows, they may be used as a rough measure of average cow life. If a rancher has an average annual cull rate of 16%, on average, a cow lasts 6.25 years in that herd ($100/16=6.25$).

Cow productivity — Separate from the productive life of a cow, this figure is typically measured in terms of the weaning weight of calves. The size and number of calves weaned and sold per cow exposed to a bull will alter this value considerably. Heavier weaning weights imply more income generated per cow, allowing a bigger budget for replacement females in higher-income herds.

Cow costs — If weaning weights were all that mattered, we would raise extremely large cows. But large cows tend to cost more and have larger maintenance costs. What it (truly) costs to run a cow impacts the value. The higher the cost, the less one can afford to pay for replacements.

Salvage value — If the salvage or cull value is expected to increase over time, then what a producer can afford to pay per replacement female increases. In the past, these values have been fairly low, but these figures have increased over the past few years.

Calf prices — If cattle prices over the productivity life of the cow are expected to be high (or higher), on average, then the price cattlemen can pay for replacements increases. Understanding the cattle cycle dynamics is important here.

Interest rates — Higher feeder cattle interest rates imply more expensive borrowing costs, and thus the less one can pay for replacements. Over the past 15 years, interest rates have been declining, but in the last six months, they have jumped significantly — from about 5.5% to 8.2%. If you are not borrowing money, then you can pay a lot more for replacements. **BA**

inflation, cow inventories, weather events, etc. — all of which contribute to the value of a replacement cow,” Dennis explains. “Ultimately, these factors contribute to a single breakeven value (see Replacement Value Factors).”

Schulz believes calculating Net Present Value (NPV) offers the most accurate assessment of replacement value.

“Net Present Value is a means of taking into account that a time value of money exists and discounts future returns such that all results are in ‘today’s dollars,’” Schulz says. “Net present value is calculated by subtracting the initial investment from the sum of discounted cash flows. If the net present value is positive, meaning that the discounted futures earnings are greater than the initial investment, then the investment has earned a rate of return greater than the discount rate and is acceptable to pursue.”

Further, Schulz points to an ISU decision aid (see Value Assessment Tools, Net Present Value of Beef Replacement Females) that determines NPV, as well as the maximum bid price. The latter calculates the initial investment value equating NPV to zero, given the required rate of return (discount rate) or opportunity cost of capital.

“The maximum bid price provides a benchmark to compare to current market prices,” Schulz explains. “If current market prices are below the calculated maximum bid price, then purchasing replacement females would likely be in order. If current market prices are above the calculated maximum bid price, purchases of replacement animals should likely be delayed.”

The decision aid also allows users to change input levels and conduct sensitivity analyses. For instance, looking at the impact of reducing annual cow cost by \$50, increasing weaning weights by 25 pounds or getting another calf or two from the replacement.

Although it’s more of an annual decision for some producers, given what markets incentivize each year, Schulz also encourages producers to compare the cost of buying replacements versus developing their own (see Raising Versus Buying Heifers for Beef Cow Replacement).

It starts with knowing costs

“If you don’t know unit cost of production per calf, you don’t know whether the price offered is a good one, and you can’t know what can be paid for a replacement female,” Machen says.

Unit cost of production is calculated by dividing total annual cow maintenance cost by average weaning weight adjusted for weaning rate. Unlike breakeven cost, Machen explains this calculation does not include secondary income, such as revenue from open replacement females, market cows and salvage bulls.

Replenishing drought-culled herds always offers an opportunity to change the composition of the cow herd if change is warranted, Machen says. It could be a need to reduce mature cow size, increase adaptability, etc.

“Average weaning weights across the industry have not increased appreciably in decades; yet, mature cow size has increased steadily. It tells you the unit cost of production is increasing,” Machen explains.

Ask someone what it costs them to run a cow. Commonly, the answer boils down to variable expenses, which are really the proverbial tip of the iceberg.

“Supplemental nutrition, labor and depreciation are typically among the top five contributors to annual cow cost. Supplemental nutrition is influenced by weather and stocking rate, while labor is usually a fixed cost. Depreciation (a non-cash cost) can be influenced by management actions/decisions,” Machen says. Keep in mind, he refers to depreciation calculated for accounting and management purposes rather than depreciation calculated for taxes.

More specifically, depreciation revolves around cow cost and salvage value. Machen explains annual per-head depreciation is determined by dividing the difference between cow cost and salvage value by the useful life of the cow.

Since depreciation is not a cash cost, Machen says many producers pay it too little attention. “Perhaps a more resonating approach is to quantify the impact of cow purchase price (and the concomitant depreciation) on weaned-calf unit cost of production,” he says.

Machen provides the example of buying a cow for \$3,000. He estimated the cow’s salvage value after five years of use at \$932 (1,159 pounds and \$89.06 per hundredweight). That equates to \$2,068 total depreciation for the cow: \$414 per year. Bottom line, cow depreciation in a herd with an 84% weaning rate and an average weaning weight of 500 pounds means that depreciation adds \$20 per hundredweight to weaned-calf unit cost of production for the cow’s first five calves.

The four variables above represent the opportunities to lower the contribution of depreciation to weaned calf unit cost of production in Machen’s scenario: reduce replacement cost, increase salvage value, increase average weaning weight or increase the percentage of calf crop weaned.

As well, Machen points out cow longevity has an obvious impact on depreciation.

“Cows that remain productive beyond their removal from the depreciation schedule turn the depreciation expense into a ‘depreciation credit,’” Machen explains. “Productive cows remaining in the herd after weaning a fifth calf (in his example) do not incur depreciation expense and therefore wean calves with a lower unit cost of production. Likewise, long-productive cows reduce the number of heifers kept for replacement or the number of cows purchased in a high-priced market.” **BA**

Value Assessment Tools

Gathering and accounting for factors to assess replacement female value is neither quick, nor easy. That’s why automated decision aids developed by Land Grant universities can be so useful. A few are listed below.



2023 Beef Heifer Replacement Forecast

University of Nebraska Lincoln (UNL)



2023 Heifer Replacement Values

Kansas State University (K-State)

“The primary difference between these tools is the assumptions/data used in the calculations and how flexible one wants to be in modifying the assumptions,” according to Elliott Dennis, Extension livestock economist at the University of Nebraska-Lincoln (UNL). “The UNL estimates are based on the Food and Agricultural Policy Research Institute at the University of Missouri projections for cattle value, as well as on the cost of production and related data from UNL’s Gudmundsen Sandhills Laboratory ... Alternative scenarios are provided but one cannot adjust the models’ underlying assumptions. K-State estimates are largely based on USDA-ERS 10-year projections, they are static (produce one value rather than a distribution of values) and the user can modify most assumptions.”



Net Present Value of Beef Replacement Females

Iowa State University (ISU)



Raising Versus Buying Heifers for Beef Cow Replacement

Iowa State University (ISU)

“A word of caution,” Dennis says. “Most tools use a representative operation that does not reflect an individual producer but rather an average over many producers. There is no expectation that the cost and production assumptions reflect exactly a particular producer. Forecasts, such as the tools mentioned, are intended to help individuals create a reference point for individual situations and expectations of future events. Producers can use these, other information and their own ideas to arrive at what a reasonable value might be for a heifer/cow purchased or retained for replacement.” **BA**

