Effects of tax reform on beef cattle operations

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A less attractive investment

The Tax Reform Act of 1986 (TRA) contains a multitude of provisions that will ultimately affect every business and individual taxpayer. Significant tax rate reductions in the Act are financed through termination of many popular investment incentives and closure of several income tax "loopholes."

In agriculture, livestock enterprises face the most significant changes and are the ones most likely to experience increased income taxes. All farm taxpayers are potentially affected by termination of the investment tax credit and increased asset lives for depreciation purposes. One of the most significant changes affecting livestock producers was the loss of favorable capital gains provisions for cull breeding animals. TRA also placed restrictions on current deduction of preproduction costs for breeding livestock. Recently, the Technical and Miscellaneous Revenue Act of 1988, signed by President Reagan in November 1988, repealed the so-called "heifer tax" and restored preproduction expensing for livestock producers, effective January 1, 1989. Thus, provisions related to capitalization of preproduction expenses for livestock, discussed in this article, were effective for only two tax years, 1987 and 1988. This article examines the impact of changes in selected income tax provisions on after-tax returns from the TRA. It examines ranch operating practices with emphasis on record-keeping requirements and optimal policies for replacement of beef cows.

Record-keeping requirements

Before the TRA, cattle producers could deduct costs of raising breeding animals as a current expense and treat all income from the sale of a raised animal held for breeding purposes for at least 2 years as capital gains. For 1987 and 1988, TRA generally requires that all taxpayers (including livestock producers) capitalize the direct and assignable indirect costs of producing property for use in a business if the property has a preproductive period of more than 2 years. These costs are placed in a capital account (rather than being deducted from income as a current expense) and are depreciated over the tax life of the asset when the asset is placed in service. As noted above, livestock producers will be exempt from the requirement after January 1, 1989.

Internal Revenue Service (IRS) rules indicate that the preproductive period for animals begins at the time of acquisition, breeding, or embryo implantation and ends when the animal is ready to perform its intended function—give birth and enter the cow herd. The preproductive period for most cattle is thus at least 33 months and all preproductive period expenses are subject to capitalization requirements. The rules do not apply to animals held for slaughter, regardless of the preproductive period.

To determine preproductive expenses for 1987 and 1988, livestock producers could: (1) keep detailed records of all direct and indirect costs of raising the animals subject to the capitalization rules, or (2) use an acceptable method of inventory valuation as a substitute for actual costs. The acceptable methods mentioned in IRS regulations are the farm-price method and the unit-livestock method. The farm-price value for an animal is its price in the nearest market less the direct costs of selling the animal in that market. The unit-livestock method is a substitute for a detailed cost inventory. The taxpayer gives each class of livestock (calves, yearlings, 2-year-olds, and cows) a standard value that represents the average cost of raising an animal in that class. Once established, the classes and values cannot be changed without IRS consent.

A modified version of the unit-livestock method was issued as IRS notice 88-24 on March 16, 1988, to help ranchers comply with the new capitalization rules for 1987 and 1988. This notice provides for a "safe harbor" by specifying amounts to be capitalized for beef and dairy cattle. A rancher electing the safe harbor method for beef cattle must capitalize a total of $340 per cow over a 3-year period. One-fourth of this amount ($85) must be capitalized in the year the calf is born, one-half ($170) in the following tax year, and the remaining one-fourth in the second taxable year following birth. Dairy cattle owners can use the same scheme but the amounts are increased to $135, $270, and $135 for a total of $540. Preproductive expenses placed in a capital account are recovered as depreciation over the 5-year tax life of the cow beginning the year she calves.

Individual farm taxpayers not otherwise required to use an accrual method of accounting could choose not to be subject to the uniform capitalization rules by making the election on their tax return for their first tax year beginning after December 31, 1986. Taxpayers who were eligible to make the choice were considered to have made it if they did not capitalize the costs of raising replacement breeding animals on their 1987 tax return. Thus, farm taxpayers have already decided whether or not to use uniform capitalization rules and the election can only be revoked with the consent of the IRS.

Taxpayers making the election to treat preproductive expenses as current expenses face the prospect of slower cost recovery for purchased assets, since they must use alternate accelerated cost recovery system (ACRS) or modified accelerated cost recovery system (MACRS) depreciation for all assets placed in service during any tax year when the election is in effect. Even electing out of the uniform capitalization rules does not allow the taxpayer to avoid increased record-keeping requirements. Animals otherwise subject to the preproductive expense rules are subject to recapture rules in figuring gain on disposition. The rules state that the farm-price or unit-livestock methods can be used to determine deductions that would have otherwise been capitalized.

The TRA capitalization rules had two major effects on the typical cattle rancher. First, they increased record-keeping requirements by moving producers in the direction of an accrual accounting system. Second, they tended to increase taxable incomes by delaying deductions for the costs of raising replacement breeding animals. It is not surprising that the National Cattlemen's Association led the successful effort to have the application of these capitalization rules to cattle repealed.

The cow replacement problem

Beef cattle producers face a continuous problem of culling and replacement of their cow herd. While the annual culling decision is usually based on age and expected productivity, culling may take place at any time during the year as a result of health or reproductive problems. Cow productivity, as measured by calf weaning weight, typically increases from the first calf to the third or fourth calf, remains approximately constant for five or six calves, and then begins to decline. Cow weight, and cull market value, tends to follow a similar pattern over her life span. The rancher can choose to raise replacements or purchase them at the time needed.

TABLE 1. Physical data used for analysis of optimum cow culling age

Cow age	Birth rates		Death rates	Culling due to illness§	Weights		
	Rogers*	Patterson+			Cow	Heifer	Steer
yr	proportion				lb		
2	—	—	.0100	.0080	820	—	—
3	.890	.90	.0135	.0276	1000	444	474
4	.927	.93	.0113	.0234	1100	464	496
5	.945	.95	.0073	.0367	1100	486	520
6	.943	.94	.0146	.0403	1100	486	520
7	.930	.93	.0160	.0630	1100	486	520
8	.908	.93	.0160	.0736	1100	486	520
9	.870	.92	.0166	.0922	1100	486	520
10	.820	.92	.0166	.1070	1100	486	520
11	.766	.90	.0184	.1220	1100	464	496
12	.700	.90	.0192	.1370	1075	464	496
13	.636	.87	.0200	.1520	1050	464	496
14	.562	.82	.0208	.1670	1025	464	496
15	.450	.77	.0216	.1820	1000	464	496

Source: Data in this table are adapted from:
* Rogers. L. 1971. Replacement Decisions for Commercial Beef Herds. Washington State University Ag. Exp. Sta. Bull. No. 726.
+ Patterson, D., R. Bellows, P. Burfening, and J. Carr. Occurrence of Neonatal and Postnatal Mortality in Range Beef Cattle. Theriogenology (forthcoming).
§ Greer, R., R. Whitman, and R. Woodward. 1986. Estimation of Probability of Beef Cows Being Culled and Calculation of Expected Herd Life. Journal of Animal Science, Vol. 51, pp. 10-19.

The long lead time required when deciding whether to raise replacements, combined with fluctuating prices and decisions related to expansion or contraction of the cow herd, makes the culling and replacement decision difficult. When the effects of income tax laws and tax law changes are added, the problem becomes extremely complex.

Tax effects on optimum culling

Several income tax provisions, including capital gains, investment tax credit, depreciation, and marginal tax rates, have potentially important impacts on the optimal culling age of beef cows. Under tax law prior to TRA, a cow raised by the taxpayer and held for at least 2 years for breeding purposes had a tax basis of zero, since all costs were currently deducted from other income rather than capitalized. Income from her sale was a capital gain, which had an advantage over ordinary income because only 40% of capital gains income was subject to taxes. A producer could vary the mix of ordinary income from the sale of calves or yearlings and capital gains from the sale of cull cows to maximize after-tax income. Purchased breeding stock was eligible for the 10% investment tax credit and 5-year depreciation.

The Tax Reform Act of 1986 terminated the capital gains exclusion, ended the investment tax credit, restricted the current deduction of development expenses, and reduced marginal tax rates. These changes have important implications for beef producers.

Culling strategy

An analytical model of the beef cow culling decision, composed of equations with terms for capital gains, investment tax credit, depreciation, changing marginal tax rates, and capitalization of development costs, was set up and solved. Income tax provisions and rate schedules effective before and after the Tax Reform Act of 1986 were included in the model. The model solution considers the uncertain nature of the replacement process (early replacement due to death) and the probability that a calf will be weaned, and it accounts for changing productivity and cull value over the life of a cow. The model considers the alternatives open to the producer of either raising a replacement heifer or buying it. Ranchers who raise their replacements usually keep at least 10% more heifers than are actually needed; costs associated with this practice were included in the model.

Productivity factors and probabilities used for this study are shown in table 1. Two sets of birth rates were used to show the effect of this important variable on optimum culling age. Depreciation deductions for cattle are based on a 5-year life using either the accelerated cost recovery system or the modified accelerated cost recovery system. Cattle prices (dollars per hundredweight) used for the analysis were: steer calves, $88.50; heifer calves, $83.00; bred yearling heifers, $78.75; slaughter heifers, $69.00; cull cows, $42.50. The annual cost for a producing cow was estimated at $300 and the cost for raising a yearling from a weaned heifer calf was estimated at $240. The average weights of retained heifer calves and replacement yearlings were set at 500 and 900 pounds, respectively. These weights are higher than average because of the selection of larger heifers for replacement.

The impacts of several income tax provisions are considered in the analysis. Four marginal income tax rates, (15%, 26%, 35% and 50%) were used for the pre-TRA situation and the two new rates of 15% and 28% were used for the post-TRA tax law. The investment tax credit, capital gains exclusion, and deduction of preproduction expenses of raising a replacement heifer were available before TRA but not after. Section 179 expensing, which permits a taxpayer to treat the cost of certain qualifying property as an expense rather than as a capital expenditure ($10,000 maximum yearly limit subject to provisions that can reduce the maximum), was not considered in the analysis, even though livestock can qualify for such treatment.

Results

The optimum buy versus raise decision was to raise replacements for each alternative except the 15% tax rate, pre-TRA for the Patterson birth rates. For pre-TRA conditions, the optimum culling age decreased substantially as the marginal income tax rate of the taxpayer increased (table 2). Most of this decrease appears to be the result of the pre-TRA provisions, which excluded 60% of capital gains income from taxation. Optimal culling ages after the TRA demonstrate some variation due to productivity factors but do not vary with the owner's income tax bracket. Beef cattle management practices, which were once very dependent on the taxpayer's income situation, are now primarily dependent on cow productivity.

In this study, cows were culled because of illness or failure to wean a calf. Thus, there is a significant difference between the optimum culling ages shown in table 2 and average culling ages, a difference that increases as the optimum culling age increases. For example, the average culling age is 5.3 years for the optimum culling age of 6 years; average culling age is 7.2 (Rogers calving rate) to 7.3 (Patterson calving rate) years for an optimum culling age of 10 years; and average culling age is only 7.7 (Rogers calving rate) to 8 years (Patterson calving rate) when optimum culling age increases to 13 years.

TABLE 2. Optimum beef cow replacement age and annual steady-state profit per cow by productivity under alternative income tax rates, pre- and post-TRA

Marginal tax rate	Optimum culling age by calving rate with estimated annual steady-state profit per cow			
	Rogers		Patterson	
	Age	Profits	Age	Profits
%	yr	$	yr	$
Pre-TRA				
15	10	26	13	34
26	9	29	11	33
35	9	31	10	34
50	6	35	6	36
Post-TRA				
15	10	20	13	26
28	10	17	13	22

Profitability comparisons

A comparison of steady-state (equilibrium) profits on an annual per cow basis shows that the TRA, including capitalization of preproduction expenses, has a substantial negative impact whether measured in absolute or percentage terms (table 2). Using the Patterson productivity assumptions, the profit per cow for a taxpayer in the 15% bracket decreases from $34 before to $26 after TRA, a 24% reduction. For a taxpayer in the top tax bracket, there is a 39% reduction from the pre-TRA profit of $36 to the post-TRA profit of $22. Profits after taxes on a per cow basis generally increased with the income tax bracket in the pre-TRA situation, almost entirely as a result of the capital gains tax exclusion.

To place the importance of tax law changes in perspective, we compared the percentage change in profits due to tax reform with the impact of changes in prices, costs, and productivity. A reduction in average prices of approximately 10% for calves (from $88.50 to $80.00 for steers and $83.00 to $74.14 for heifers) and approximately 17% for culls (from $42.50 to $35.38 for cows) reduced steady state profits for the pre-TRA situation by about $27 (80%) for a taxpayer in the 15% tax bracket and by almost $21 (58%) for a taxpayer in the 50% bracket. An increase in costs of $20 per yearling heifer and $25 per cow (8.3%) reduced profits by almost $19 (55%) for a taxpayer in the 15% tax bracket and by almost $12 (33%) for a taxpayer in the 50% bracket. The impact of a change in calving rates is shown in table 2. Moving from the Patterson series to the Rogers series resulted in an $8 (24%) per head reduction in profits for a taxpayer in the 15% bracket and a $1 (3%) per head reduction for a taxpayer in the 50% bracket. An increase in productivity represented by a 50% reduction in cow illness and death rates increased profits by almost $8 (23%) for taxpayers in the 15% bracket and by less than $4 (11%) for taxpayers in the 50% bracket. Thus, the budgeted changes in prices and costs had a greater impact on profits than did tax law changes in the Tax Reform Act of 1986. The TRA, however, had a greater impact on returns than did fairly significant changes in calving rates or illness and death rates.

The livestock industry's interest in restoring preproductive expensing to the tax code was mentioned earlier. To obtain an indication of the relative importance of preproductive expensing to ranchers' profits, we examined the value of the provision in terms of the change in value of an infinite stream of replacement cows that would occur under present income tax provisions with TRA fully effective. We found that addition of expensing would increase profits almost $4 (15%) per cow for the 15% bracket taxpayer and over $7 (33%) per cow for a taxpayer in the 28% bracket. While post-TRA profits in table 2 will be increased by these amounts after January 1, 1989, when expensing is once again available for breeding livestock, the optimum post-TRA culling ages of 10 and 13 years remain the same.

Conclusions

The Tax Reform Act of 1986 can be expected to have significant impacts on beef cattle ranching operations. Provisions requiring capitalization of preproductive expenses increased record-keeping requirements for 1987 and 1988. Capitalization, together with termination of the investment tax credit and the capital gains exclusion, reduces profits for a given level of prices and costs. Numerical analysis indicates that the total package of tax law changes increases the optimum age for culling beef cows, especially for taxpayers in the highest marginal tax brackets. The culling decision is now based on cow productivity rather than the tax bracket of the owner.

The change in tax laws for livestock will make beef cattle investments less attractive, especially for nonfarm investors. While our calculations indicate that the individual rancher will have lower after-tax income for a given level of prices and costs under provisions effective in TRA, we have not attempted to estimate the effect of the changes on the total cattle herd and on cattle prices. It is reasonable to expect an aggregate increase in cattle prices due to a smaller total herd to partially or even totally offset the short-term reduction in profits for the individual rancher.

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Controlling seepage from evaporation ponds

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Under soil conditions characteristic of the west side of the San Joaquin Valley, subsurface drainlines could recover as much as 90% of potential seepage losses from evaporation ponds.

Subsurface drainage from irrigated cropland on the west side of the San Joaquin Valley is managed by reducing the volume of drainage water and disposing of collected drainwater in evaporation ponds. Nearly 6,700 acres of land are now being used for evaporation ponds. Applications for another 10,500 acres of ponds have been made to the Central Valley Regional Water Quality Control Board. Construction of additional evaporation ponds is expected in the near future for irrigated lands having limited or no other alternatives for disposal of drainwater.

Environmental degradation similar to that seen at Kesterson Reservoir could also occur with evaporation ponds. Potential degradation of groundwater below the pond by contaminated pond water may be reduced however, by designing ponds to minimize seepage losses. Seepage is often controlled by lining ponds with compacted clays or plastic. Both are expensive to install. This study was designed to learn if subsurface drainlines beneath evaporation ponds could recover seepage losses and possibly avoid the need for liners.

Model development

Results from field investigations at several evaporation ponds were used to develop a theoretical cross-section of the soil underlying the ponds. Seepage from ponds in operation for over two years was found to be fairly steady, and the soil below the pond was saturated. Pond water levels were held at depths of 0.5 feet to about 6 feet. Flow conditions at pond boundaries varied, depending on the hydrogeologic setting and on whether or not there was a subsurface drainage system around the pond.

The conceptual cross-section of the pond used in the modeling shows flow features important in seepage losses: perimeter drains, the existence of lateral subsurface