

AGRICULTURAL ALTERNATIVES

<http://agalternatives.aers.psu.edu>

Beef Cow-calf Production

The United States is the leading beef producer in the world. Almost 26.9 billion pounds of beef were produced in the United States in 2000 and per capita consumption totaled 78 pounds. The cattle cycle currently is in a declining phase. A smaller calf crop, a slight decline in cattle feeding, small decline in slaughter rates, and stable consumption rates will be evident for several years. Profitability in the cattle business usually increases as production declines.

Cow-calf production is the first stage of the beef production process. An average of about 2.2 years elapses between the breeding of beef cows and heifers and the time their offspring are ready for slaughter. Heifer calves may be retained for herd expansion or sold along with the steers to feedlot operators who will continue to grow out these animals and finish them for slaughter.

In 2000, there were 33.95 million head of beef cows (approximately 1 million head less than 1994) widely dispersed throughout the United States on about 831,000 farms and ranches. Beef cows are raised in all regions where there is pasture and hay. Presently there are 141,000 beef cows on 11,100 Pennsylvania farms. Beef cow numbers in Pennsylvania reached a peak of 247,000 head in 1982. After several years of decline, numbers dropped to 176,000 head in 1990, but have exceeded 200,000 head since 1992.

The beef cow-calf business is well adapted to small-scale and part-time farmers who have land suitable for pasture

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and hay production. As in most other states, cow-calf operations in Pennsylvania are rather small, with 97 percent of these enterprises having fewer than 50 cows. Only 2.2 percent of Pennsylvania's operations have 50 to 99 head, while 0.8 percent of the operations have more than 100 cows. Because of the relatively small size of these operations, it has been difficult for individuals to develop innovative marketing programs.

Marketing and Preconditioning

About two-thirds of feeder cattle marketed from cow-calf operations are sold as calves in the third or fourth quarter of the year at or soon after weaning. Pennsylvania calves are sold directly to feeding operations or marketed through specialized feeder calf sales, livestock auctions, and electronic and video sales. A limited market also exists for selling top-quality steer calves to 4-H and FFA members as show prospects.

Because of the wide distribution of cow-calf operations throughout the state, there are markets for calves in almost every county. The sale prices of calves can vary greatly depending on breed, weight, health, uniformity, group size,

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and the way in which the cattle have been handled. Regardless of whether the calves are sold through a local auction, direct to a cattle feeder, or through a broker, preparation for sale greatly influences the sales price and profitability. A preconditioning program is an important practice that not only improves sale price, but also enhances calf well-being on the farm and in the feedlot. Preconditioning includes weaning the calves about six weeks before sale time, starting them on feed, castrating, dehorning, vaccinating, deworming, and perhaps implanting them with a growth promotant. These practices help ensure that the calves will stay healthy and have a good start in feedlots.

Most cattle feeders prefer to purchase groups of 40 or more preconditioned calves separated by sex, breed, and weight. Market outlets such as graded sales are popular because calves from different farms can be combined and sorted into uniform groups for sale either by brokers, through traditional auctions, or by teleauction (buyers bid by participating in a conference telephone call) or video auction (buyers bid after viewing cattle on their television from a satellite downlink). If producers market through teleauction or video auction, their calves will not have to leave the farm to be offered for sale. Uniform sale groups require tight breeding and calving seasons (all within 60 days), proper nutrition of the cow herd and the calf, and the desirable genetics obtained through strict selection of replacement heifers and herd sires. Another possible marketing option is selling high-quality calves to 4-H and FFA members at prices slightly higher than for commercial feeder calves. However, this market is unpredictable.

Retained ownership is another marketing option. Retaining ownership of the calves from the cow-calf herd and either feeding the calves on-farm or having the calves “custom fed” at a growing or finishing operation may be advantageous. Retaining ownership provides an opportunity for the herd owner to profit both from the cow-calf operation and from the finishing enterprise. Naturally, with the potential benefits come additional risks from falling prices and death losses.

Getting Started

There are several different ways of starting a commercial beef cow-calf herd: (1) buying heifers of either weaning or breeding age; (2) purchasing an entire cow herd; and (3) purchasing individual cows from established herds. When deciding on the source of cows or heifers, the genetic potential and health program of the herd should be considered.

If you have a good, relatively inexpensive source of feed, a good time to purchase bred cows and replacement heifers for spring breeding is from December to January. Feeding these animals until the pasture season begins is expensive, so their selling price will generally be lower. Animals that are purchased during this time of the year should be healthy and tested not only for pregnancy, but also for the stage of pregnancy and projected calving date.

Housing and Facilities

A herd calving in late winter or early spring requires little or no housing. However, some provision for maternity pens or sheltered lots should be provided. Except when calving in very cold, wet, and windy conditions, cow herds perform best (and most economically) with shelter only from hills or windbreaks. As long as there is adequate shelter, cold temperatures are not as detrimental to cow or calf health as muddy conditions with extreme variation between night and day temperatures.

One of the most important facilities in a cow-calf enterprise is a corral and chute. These are essential for normal management and health maintenance practices (e.g., vaccination and deworming), as well as for pregnancy testing or assisting a cow at calving. A cattle-handling system can be designed as a one-person operation using wing fences and crowding gates to assist in moving cattle to automatic head gates. For possible designs for cattle handling facilities, consult the suggested references at the end of this bulletin.

Health Program

The most important component of a herd health program is the use of vaccinations. Any health program should include vaccinations for infectious bovine rhinotracheitis (IBR), parainfluenza 3 (PI3), bovine syncytial virus (BRSV), bovine viral diarrhea (BVD), haemophilus sommus, leptospirosis, and clostridial diseases. Tuberculosis testing and calf vaccination for brucellosis should be included. Fecal samples should be taken on a random selection of all cattle of different ages to determine internal parasite infections. An appropriate deworming schedule can be developed from the results of the fecal tests. Treatment for lice and flies is essential for maintaining animal well-being and performance.

Another way of reducing cattle health problems is to isolate the herd. Purchasing herd replacements from breeders who have long-established vaccination programs and a history of well-managed cattle will reduce herd health problems. Calving early in the spring also reduces the seriousness of various calf diseases. Producers should be sure to consult a veterinarian when developing a health program.

Use of Growth Promotants

Cow-calf enterprises can benefit from the use of growth-promoting implants. These implants can increase both feed efficiency and growth rate. Some growth promotants can be used twice during the preweaning period (weaning at seven months of age). Preconditioning programs also include implanting at or shortly after weaning. Make sure you follow the implanting instructions and recommended length of time between implants. Implanting can increase calf

weaning weights by 4 to 8 percent and is one of the most profitable individual practices that can be applied to beef-cattle management.

Nutrition and Feeding

One of the advantages of the beef cow herd is that relatively low-quality forages can be fed to the bred cows after the calves have been weaned. For a cow herd calving in March (calves weaned in October), relatively low-quality forages can be used for a three-month period (November to January). However, relatively high-quality forages should be available for the cows starting approximately two months before calving. Feeding high-quality forages during this period allows the cows to gain weight, rebreed quickly, and produce sufficient milk to yield heavy calves at weaning.

It is important to provide trace-mineralized salt and a source of calcium, phosphorous, and magnesium throughout the year, preferably through free-choice loose salt and mineral sources. In many areas mineral supplements should contain additional selenium.

Spring calving usually is preferred in Pennsylvania and surrounding states for a variety of reasons. These include (1) feeding least-cost high-quality forages soon after calving; (2) making the best use of low-quality forages early in the winter during the immediate postweaning period; (3) grouping calving in the spring for sale in the fall; and (4) rearing calves in a more healthy environment on pasture as opposed to rearing fall calves in a dry lot over the winter.

Pastures

Approximately two-thirds of the forage requirements for a cow-calf herd should come from pasture and the other third from stored feed (hay or silage). Feed costs for the cow herd can be reduced by grazing cornstalks after harvest and providing cool-season stockpiled forages such as tall fescue. Pasture with tall fescue and similar early-growing grasses also can be used as calving areas. Some small grains, such as rye or wheat, offer the same potential for early winter and spring grazing. Midsummer grazing can be improved with the use of brassicas, annual grasses such as sudangrass, and with alfalfa/grass combination pastures.

**Many intensive grazing systems have been developed for beef cattle in the past few years. Intensive rotational grazing systems can increase beef production per acre by 25 percent or more without reducing cattle performance. Other practices, such as creep grazing (in which the calves graze the pastures in a rotational scheme ahead of the cows), also can increase calf weaning weights and reduce or replace grain in the diet. Efficient use of pastures by the beef cow herd of other cattle enterprises cannot be discussed in detail in this bulletin. Therefore, the reader is encouraged to consult the recommended publications.

Sample Budgets

Included in this publication are two sample beef cow-calf budgets. The first summarizes the costs and returns of a cow-calf enterprise using a feeding program of hay and pasture, and the second summarizes the costs and returns of a cow-calf enterprise using a feeding program of silage and pasture. The cow-calf enterprise assumes the sale of steer calves at 550 pounds and heifers at 525 pounds and includes the cost of growing replacements. These budgets should help ensure that you include all costs and receipts in your calculations. Costs and returns are often difficult to estimate in budget preparation because they are numerous and variable. Think of these budgets as an approximation and make appropriate adjustments using the "your estimate" column to reflect your specific production conditions. Additional livestock budgets can be found on the Agricultural Alternatives Web site: <http://agalternatives.aers.psu.edu/>. More information on using livestock budgets can be found in *Agricultural Alternatives: Enterprise Budget Analysis*.

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For More Information

Beef Housing and Equipment Handbook (MPWS-6). Ames, IA: Midwest Plan Service, 1987. Available from the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802-2602.

Wilson, L. L., G. L. Greaser, E. H. Cash, J. W. Comerford, and J. K. Harper. *Agricultural Alternatives: Dairy-beef Production*. University Park, PA: Penn State Cooperative Extension, 1995.

Engle, C., G. L. Greaser, and J. K. Harper. *Agricultural Alternatives: Beef Backgrounding Production*. University Park, PA: Penn State Cooperative Extension, 1996.

Greaser, G. L. and J. K. Harper. *Agricultural Alternatives: Enterprise Budget Analysis*. University Park, PA: Penn State Cooperative Extension, 1994.

Holstein Beef Production Proceedings (NRAES-44). 1991. Available from the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802-2602.

Special Circulars 276 (*Beef Cattle Rations*, 1992), 301 (*Keeping Feeder Cattle Healthy*, 1984), and 306 (*Cattle Vaccines*, 1994). Available from the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802-2602.

Web Sites

<http://muextension.missouri.edu/xplor/agguides/ansci/>

<http://www.ansi.okstate.edu/indextext.htm>
(includes updated list of U.S. beef breed associations)

<http://www.ibt.iastate.edu>

Associations

Pennsylvania Cattleman's Association
W17 Halfmoon Valley Road
Port Matilda, PA 16810

Penn State Beef Cattle Extension
Department of Dairy and Animal Science
324 Henning Building
University Park, PA 16802

Initial resource requirements	
Investment in Cattle and Equipment	
■ 50 females @ \$750 to \$1,200 per cow	\$37,500 to \$60,000
■ Two bulls @ \$1,000 to \$2,000	\$2,000 to \$4,000
Total	\$39,500 to \$64,000
(If artificial insemination was used during the early part of the breeding season, one bull would be adequate.)	
■ All-purpose building for calving, hay and grain storage	\$5,000 to \$12,500
■ Corral or handling facility with headgate	\$500 to \$5,000
■ Fencing	\$5,000 to \$8,000
■ Feeding bunks and racks	\$250 to \$1,000
■ Self-feeders for minerals	\$200 to \$400
■ Small equipment (syringes, needles, halters, etc.)	\$100 to \$200
■ Used tractor with front-end loader	\$5,000 to \$10,000
■ Used hay wagon	\$500 to \$1,200
■ Used manure spreader	\$2,000 to \$5,000
■ Used mower-conditioner	\$2,000 to \$5,000
■ Used grain drill	\$1,500 to \$3,000
■ Used hay baler	\$2,000 to \$8,000
Total	\$24,050 to \$59,300

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Sample Cow-Calf Budget for cows weighing 1,200 pounds, hay-pasture program

Selling Steers at 550 lb and Heifers at 525 lb.

Item	Quantity	Unit	Price	Amount Per Cow	Your Estimate
Receipts					
Steer calf	248	pounds	\$0.64	\$158.00	_____
Steer calf ¹	236	pounds	\$0.88	\$208.00	_____
Heifer calf ²	68	pounds	\$0.86	\$58.00	_____
Heifers (cull replacements) ³	83	pounds	\$0.78	\$64.00	_____
Cull cows ⁴	240	pounds	\$0.60	\$144.00	_____
Cull bulls ⁴	18	pounds	\$0.60	\$6.00	_____
<i>Total receipts</i>				\$474.00	_____
Variable costs					
Feed					
Pasture	1.5	acres	\$30.00	\$45.00	_____
Hay (Mixed grass & legumes)	2.15	ton	\$80.00	\$172.00	_____
Soybean meal	0.5	cwt	\$12.00	\$6.00	_____
Crop residue	0.2	ton	\$10.00	\$2.00	_____
Salt and mineral	90	lb	\$0.12	\$10.80	_____
<i>Total feed costs</i>				\$235.80	_____
Health program	1.00	cow	\$14.00	\$14.00	_____
Hired labor	0	hours	\$6.00	\$0.00	_____
Transportation	1.00	cow	\$5.00	\$5.00	_____
Artificial insemination	1.00	cow	\$0.00	\$0.00	_____
Marketing	1.00	cow	\$10.00	\$10.00	_____
Supplies and misc.	1.00	cow	\$15.00	\$15.00	_____
Interest on operating capital ⁵				\$11.63	_____
<i>Total variable costs</i>				\$291.43	_____
Fixed costs					
Labor charge	0	hours	\$6.00	\$0.00	_____
Bull replacement costs ⁶				\$3.50	_____
Interest on investment ⁷	1	cow	\$76.80	\$76.80	_____
Fence	1	cow	\$10.00	\$10.00	_____
Buildings	1	cow	\$5.00	\$5.00	_____
<i>Total fixed costs</i>				\$95.30	_____
Total costs				\$386.73	_____
Returns					
Returns over variable costs				\$182.87	_____
Net returns				\$87.57	_____

¹Avg. weaning weight = 550, 90% calf crop, 1/2 bulls.

²Avg. weaning weight = 525, 90% calf crop, 1/2 heifers, .205 keep for replacement.

³11 percent are sold to other cow-calf operators or to the slaughter market.

⁴Cull cows weight = 1,300, .5% death loss, and a 20% culling rate for cows, bull's weight = 1,800, 0% death loss, and a 25% culling rate for bulls.

⁵Interest on working capital.

⁶Bull replacement is 25% annual replacement rate. Bull costs \$1,400, with 25 cows per bull.

⁷Interest on investment per cow.

Sample Cow-Calf Budget for cows weighing 1,200 pounds, silage-pasture program

Selling steers at 550 lb and heifers at 525 lb.

Item	Quantity	Unit	Price	Amount Per Cow	Your Estimate
Receipts					
Steer calf ¹	236	lb	\$0.88	\$208.00	_____
Heifer calf ²	68	lb	\$0.86	\$58.00	_____
Heifers (cull replacements) ³	83	lb	\$0.78	\$64.00	_____
Cull cows ⁴	240	lb	\$0.60	\$144.00	_____
Cull bulls ⁴	18	lb	\$0.60	\$6.00	_____
<i>Total receipts</i>				\$474.00	_____
Variable costs					
Feed					
Pasture	1.5	acres	\$30.00	\$45.00	_____
Silage	4.2	ton	\$23.75	\$99.75	_____
Soybean meal	2	cwt	\$12.00	\$24.00	_____
Crop residue	0.2	ton	\$10.00	\$2.00	_____
Salt and mineral	90	lb	\$0.12	\$10.80	_____
<i>Total feed costs</i>				\$181.55	_____
Health program	1.00	cow	\$14.00	\$14.00	_____
Hired labor	0	hours	\$6.00	\$0.00	_____
Transportation	1.00	cow	\$5.00	\$5.00	_____
Artificial insemination	1.00	cow	\$0.00	\$0.00	_____
Marketing	1.00	cow	\$10.00	\$10.00	_____
Supplies and misc.	1.00	cow	\$15.00	\$15.00	_____
Interest on operating capital ⁵				\$9.46	_____
<i>Total variable cost</i>				\$235.00	_____
Fixed costs					
Labor charge	0	hours	\$6.00	\$0.00	_____
Bull replacement costs ⁶				\$3.50	_____
Interest on investment ⁷	1	cow	\$76.80	\$76.80	_____
Fence	1	cow	\$10.00	\$10.00	_____
Buildings	1	cow	\$5.00	\$5.00	_____
<i>Total fixed cost</i>				\$95.30	_____
Total cost				\$330.31	_____
Returns					
Returns over variable costs				\$239.29	_____
Net returns to land, labor, & management				\$143.99	_____

¹ Avg. weaning weight = 550, 90% calf crop, 1/2 bulls.

² Avg. weaning weight = 525, 90% calf crop, 1/2 heifers, .205 keep for replacement.

³ 11 percent are sold to other cow-calf operators or to the slaughter market.

⁴ Cull cow's weight = 1,300, .5% death loss, and a 20% culling rate for cows, bull's weight = 1,800, 0% death loss, and a 25% culling rate for bulls.

⁵ Interest on working capital.

⁶ Bull replacement is 25% annual replacement rate; bull costs \$1,400, with 25 cows per bull.

⁷ Interest on investment per cow.