
AGRICULTURAL ALTERNATIVES

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Feeding Beef Cattle

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, and several more years are expected of smaller calf crops, a slight decline in cattle feeding, small decline in slaughter rates, and stable consumption rates. Profitability in the cattle business usually increases as production declines.

Traditional feeder-cattle enterprises grow weaned calves (450 to 600 pounds) and yearling steers or heifers (550 to 800 pounds) to slaughter weights of 1,100 to 1,400 pounds. Cattle feeding operations exist in all regions of the United States, but most large operations are in the Great Plains from Colorado and Nebraska to Texas. Most cattle feeding operations are relatively small. About 96 percent of all operations have fewer than 1,000 head, but these small lots market 18 percent of the cattle fed each year. Feedlots with more than 32,000 head, on the other hand, comprise less than 1 percent of the total feedlots but account for nearly 35 percent of the cattle sold.

Cattle feeding in Pennsylvania has been a fairly stable business. In the past 35 years, the number of cattle on feed on January 1 has ranged from 75,000 to 89,000 head. On January 1, 2000, about 75,000 cattle were on feed in Pennsylvania, or 1 percent of the U.S. total. The cattle fed are a mix of beef breeds, crossbreeds, or dairy beef (mostly



Holstein steers). Pennsylvania presently packs about 3 percent of U. S. beef.

Cattle feeding is a high-risk business. During some years, an operation may not recover out-of-pocket costs. Entry into the cattle feeding business has few restrictions. Although facilities range from small lots with a few head to modern facilities with more than 50,000 head, there are economies of scale in cattle feeding. The cost of feeding per animal drops as the number of animals in the operation increases. Because of the high risks and the economies of scale that favor larger operations, beef-feeding enterprises are not as well adapted to small-scale and part-time farms as are beef cow-calf operations. In addition, less land is required for a cattle feeding operation than for a cow-calf enterprise.

Getting Started

Thorough planning and preparation are essential if you are to have a successful feeding operation. Operators should determine where they will obtain feeder calves, which feeds will be required to finish the cattle to desired market weights and grades, and what type of shelter will be needed (particularly since most feedlot cattle are on hand over the winter months). Feeders also should design a health program in cooperation with a veterinarian, decide what the starting

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and slaughter weights and grades should be, and assess marketing alternatives. Visit successful cattle feeding operations to help determine what facilities are needed, such as a handling chute and head gate to properly restrain animals when they are vaccinated, implanted, or treated in a health program.

Facilities

Various materials can be used for feedlot fences, including boards, wire panels, high-tensile wire, and steel cables. Barbed wire is not recommended. A 7- or 9-wire high-tensile fence is one of the most economical barriers. Another effective fence is a combination of high-tensile wire (which can be electrified) with three or four 2-by-6-inch planks spaced between the wires.

Housing for feeder cattle does not have to be extensive or weather tight—open-sided sheds and more completely enclosed structures are equally effective. Younger cattle require more shelter than older cattle, especially for protection from winter winds. All facilities should be designed for the number of cattle fed and include a good manure management program.

Most feedlots use concrete feed bunks that allow cattle to feed from one or both sides, although feed bunks of treated lumber also can be used. Feed can be delivered through a mixer wagon, conveyor with a belt or chain, or a bucket loader.

To reduce mud, use concrete pads for areas around waterers and feed bunks. Mounds that are 3 to 5 feet high offer cattle relatively dry ground to rest on. The feedlot area should be well drained with topsoil removed to expose clay or other fairly impervious surface. Whether the feedlot surface is dirt, clay, concrete, or other material, it should be cleaned periodically. Design the facilities to prevent manure runoff into streams or other waterways. Retention lagoons and diversion ditches should be planned with the advice and approval of regulatory agencies.

Grazing and Backgrounding

Many cattle feeders purchase lightweight feeder calves (350 to 550 pounds), graze them during the spring and summer, and then finish them in the feedlot starting in late summer or fall. Backgrounding is a special type of program that usually combines pasture systems and lightweight cattle. These cattle require extremely good nutrition, management, and health programs, but backgrounding can be profitable. Well-managed, high-quality pastures can be used effectively with these lightweight cattle. More information on grazing and backgrounding can be found in *Agricultural Alternatives: Beef Backgrounding Production*.

Purchasing Feeder Cattle

Feeder cattle prices fluctuate considerably in almost every season of the year. Higher-grade feeder cattle sell for a higher price per pound than lower grades. Lighter-weight cattle of the same grade cost more per pound than heavier feeder cattle. Although feeder grade is not supposed to be influenced by the amount of fat on an animal or its overall condition, cattle in better shape usually are assigned a higher grade and sell for a higher price per pound. The difference between the purchase and the sales price (the cattle margin or price spread) of feedlot cattle often is greater for healthy, but thinner, lower-grade feeder calves or yearlings because these animals usually increase in quality between purchase and sale time. Additional costs for thinner, lower-grading cattle include higher medical treatment costs, lower sales prices, and higher death-loss rates. Even with these disadvantages, lower-grading feeder cattle may be profitable; operators must consider the entire market for finished cattle. Market prices are better for higher-grading, uniformly finished cattle than for less uniform, lower-grading cattle.

Anyone purchasing feeder cattle (or any other kind of livestock) must remain up-to-date on market conditions. Graded feeder-calf sales are held in both fall and spring throughout Pennsylvania and neighboring states. Some feedlot managers use cattle brokers and tele-auctions to obtain their feeder cattle.

Health Program

Because preconditioned and heavier feeder cattle tend to have fewer health problems, purchasing preconditioned calves can be a good investment for the cattle feeder. Preconditioning includes weaning 21–45 days before shipping, vaccinating for diseases prevalent in the area, dehorning, castrating, implanting, treating for external and internal parasites, and starting the cattle on a moderate-energy ration from a feed bunk. If heavier cattle are used (700 pounds or more), preconditioning is not as important. However, respiratory and enteric (digestive) diseases can affect cattle of all ages, and they should be properly vaccinated, preferably before they are moved to the feedlot. If there is any doubt about an internal parasite infection, fecal samples should be taken to a veterinarian to determine the severity of infection. Control of external parasites such as lice and flies is also important, and inexpensive, effective treatments are available. Feeders can reduce health problems by planning a health maintenance and disease prevention program with the assistance of a veterinarian.

Nutrition

Cattle weighing 700 pounds or more should be fed a ration containing 11 percent crude protein. The remaining part of the ration is grain, usually corn. Larger-framed cattle tend to require a ration with a higher percentage of grain to achieve the same carcass quality grade as cattle with smaller frame sizes. Therefore, the ration that is fed depends on the type of cattle and the desired market grade. The weight and grade required by the market receiving the cattle also must be considered when selecting a ration. Cattle weighing 650 pounds or less initially can be fed a growing ration rather than a finishing ration. Growing rations supply additional hay or other forage in place of grain. To achieve the desired carcass grade, the ration can be modified to include less forage and more grain as the cattle grow.

The feeding system for a cattle feeding enterprise should remain flexible. For farmer-feeders, corn silage, and occasionally hay crop silages, can be incorporated into the feeding program. The extent that forages contribute to a ration is determined by the price of feed grains or food processing by-products with equivalent feed value. Increasing forages in the diet of feedlot cattle will generally increase the cost of weight gain (due to slower weight gain and higher interest costs) when grain prices, specifically for corn, are reasonably low. Specific ration composition is determined by the combination of available feedstuffs that will minimize the cost of weight gain, provide a balanced diet, and reach desired endpoints for the market. This feed combination will vary as grain prices change.

Performance enhancers such as growth-stimulating implants can also be used. Research has shown that they provide the greatest return of almost any feedlot practice.

Sample Budgets

Included in this publication are three sample budgets summarizing costs and returns for feeding beef cattle. The first is for feeding steers; the second is for feeding heifers; and the third is for feeding yearlings. 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 in 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*.

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.

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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>

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

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Initial resource requirements for slaughter-beef production

- Land: less than 1 acre
- Labor: 4 hours
- Capital
 - Feeder steer: \$462
 - Feeder heifer: \$420
 - Yearling: \$588
 - Existing buildings, improvements, and fencing: \$26/animal

Sample Slaughter Steer Budget

Bought at 550 pounds and sold at 1,300 pounds

Average Daily Gain (ADG) 3.8 pounds

Item	Market weight	Unit	Price	Total per steer	Your estimate
Receipts					
Finish steer (1% death loss)	1,296.30	pounds	\$0.80	\$1,037.04	_____
Variable costs					
Feeder calf	550	pounds	\$0.95	\$522.50	_____
Feed cost					
Corn	1.36	tons	\$100.00	\$136.00	_____
Soybean meal	1.36	cwt	\$12.00	\$16.32	_____
Salt, minerals, and Bovatec or Rumensim	110	pounds	\$0.24	\$26.40	_____
Corn silage	4.9	tons	\$23.75	\$116.38	_____
Other variable costs					
Health program				\$12.00	_____
Electricity				\$10.00	_____
Repairs on equipment and buildings				\$12.00	_____
Marketing and trucking				\$10.00	_____
Miscellaneous				\$4.50	_____
Interest on investment and operating costs				\$32.02	_____
<i>Total variable cost</i>				\$898.11	_____
Fixed costs					
Labor charge	4	hours	\$0.00	\$0.00	_____
Building				\$12.45	_____
Equipment				\$13.94	_____
<i>Total fixed cost</i>				\$26.39	_____
Total cost				\$924.50	_____
			Price received		
Returns Above Variable Cost			\$0.75	\$74.11	_____
			\$0.80	\$138.93	_____
			\$0.85	\$203.74	_____
Net Returns			\$0.75	\$47.72	_____
			\$0.80	\$112.54	_____
			\$0.85	\$177.35	_____

Sample Slaughter Heifer Budget

Bought at 525 pounds and sold at 1,100 pounds

Average Daily Gain (ADG) 3.5 pounds

Item	Market weight	Unit	Price	Total per heifer	Your estimate
Receipts					
Finish heifer (minus death loss)	1,096.75	pounds	\$0.78	\$855.47	_____
Variable costs					
Heifer costs	525	pounds	\$0.90	\$472.50	_____
Feed costs					
Corn	1.04	ton	\$100.00	\$104.00	_____
Soybean meal	1.15	cwt	\$12.00	\$13.80	_____
Salt, minerals, MGA, and Bovatec or Rumensim	98	pounds	\$0.24	\$23.52	_____
Corn silage	3.9	tons	\$23.75	\$92.63	_____
Other variable costs					
Health program				\$13.00	_____
Electricity				\$12.00	_____
Repairs on buildings and equipment				\$12.00	_____
Marketing and trucking				\$10.00	_____
Supplies and miscellaneous				\$4.50	_____
Interest on investment and operating costs				\$23.57	_____
<i>Total variable cost</i>				\$781.51	_____
Fixed costs					
Labor charge	4	hours	\$0.00	\$0.00	_____
Building				\$12.45	_____
Equipment				\$13.94	_____
<i>Total fixed cost</i>				\$26.39	_____
Total cost				\$807.90	_____
Price received					
Returns Above Variable Cost			\$0.73	\$19.12	_____
			\$0.78	\$73.95	_____
			\$0.83	\$128.79	_____
Net Returns			\$0.73	(\$7.28)	_____
			\$0.78	\$47.56	_____
			\$0.83	\$102.40	_____

Sample Slaughter Yearling Budget

Bought at 700 pounds and sold at 1,300 pounds

Average Daily Gain (ADG) 4 pounds

Item	Market weight	Unit	Price	Total per yearling	Your estimate	
Finish steer (1% death loss)	1,296.30	pounds	\$0.80	\$1,037.04	_____	
Finish steer (.5 death loss)	1,298	pound	\$0.74	\$960.52	_____	
Variable costs						
Yearling	700	head	\$0.86	\$602.00	_____	
Feed cost						
Corn	0.54	ton	\$100.00	\$54.00	_____	
Soybean meal	1.7	cwt	\$14.00	\$23.80	_____	
Salt, minerals, and Bovatec or Rumensim	93	pounds	\$0.24	\$22.32	_____	
Corn silage	6.5	tons	\$23.75	\$154.38	_____	
Other variable costs						
Health program				\$10.00	_____	
Electricity				\$8.00	_____	
Repairs on equipment and buildings				\$8.00	_____	
Marketing and trucking				\$12.00	_____	
Supplies and miscellaneous				\$4.50	_____	
Interest on investment and operating costs				\$26.26	_____	
<i>Total variable cost</i>				\$925.25	_____	
Fixed costs						
Labor charge	4	hours	\$0.00	\$0.00	_____	
Building				\$12.45	_____	
Equipment				\$13.94	_____	
<i>Total fixed cost</i>				\$26.39	_____	
Total cost				\$951.64	_____	
			Price received			
Returns Above Variable Costs				\$0.69	(\$29.63)	_____
				\$0.74	\$35.27	_____
				\$0.79	\$100.17	_____
Net returns				\$0.69	(\$56.02)	_____
				\$0.74	\$8.88	_____
				\$0.79	\$73.78	_____

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