AGRICULTURAL ALTERNATIVES

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Beef Backgrounding Production

The term "backgrounding" may be relatively new to some. However, this management system is well known to both cow-calf producers and cattle feeders. Backgrounding is a beef production system that uses pasture and other forages from the time calves are weaned until they are placed in a feedlot. Calves generally gain from 100 to 400 pounds, depending on the available forages, ration fed, and length of time involved. The weight gain comes primarily from muscle and frame development, with little from fattening. These gains are accomplished as economically as possible by making maximum use of forages such as pasture, hay, and silage. Little, if any, grain is used in most backgrounding programs.

Marketing

Before selecting a backgrounding program, be sure you have a good marketing plan. A marketing plan might include putting cattle in your own feedlot for finishing or selling them as feeders.

Purchases of calves should be grouped according to quality, weight, and sex to increase their value at market time. All animals should be preconditioned.

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Preconditioning includes purchasing calves weaned about six weeks before normal sale time, started on feed, dehorning, vaccinating, deworming, castrating males, and perhaps implanting them with a growth promotant. These practices help ensure that the calves will stay healthy and have a good start in a backgrounding program.

Not every calf is suited for a backgrounding program. Generally, calves less than eight months of age in above-average body condition are not suitable because they lose weight and condition rapidly when fed high roughage rations. Heifer calves also do not fit well into a lengthy backgrounding program. The exception would be for a cow-calf operation where backgrounding heifer calves would allow for a better selection of replacement heifers.

Steer calves weighing 400 to 600 pounds in thin to moderate condition are best suited for most backgrounding programs. These calves are ready for finishing when they reach 850 to 1,000 pounds and usually are in high demand by cattle feeders.

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Backgrounding requires some additional time to finish an animal. However, the savings gained by purchasing less feed grains during the major growth phase generally outweigh the extra finishing time. Rather than feeding lightweight calves high-concentrate rations early on, cattle feeders often buy heavier weight cattle in hopes of reducing the grain requirements for producing finished beef.

Calf and Forage Management

A successful backgrounding program requires skillful cattle and forage management combined with a good preventative health plan. Usually, calves being weaned and transported are stressed and highly susceptible to pulmonary-related diseases. A high death-loss rate can quickly erase potential profits. A sound health program developed with the aid of a veterinarian is strongly recommended. The program should include handling before and after weaning or before and after shipment in the case of purchased cattle.

Because backgrounding relies heavily on the use of quality forages, good forage management is very important. Good forage management can be achieved by harvesting forages at their optimum stage of maturity for highest nutrient content. Pastures should include a mixture of legumes and grasses. Legumes increase forage yield and protein content and will prevent the drastic reduction in pasture production and quality that often occurs during the summer months. With home-grown calves, weaning stress can be reduced somewhat by providing good-quality mixed hay and 2 pounds of corn two to three weeks before weaning. This practice will also acclimate calves to eating dry feeds from troughs. If good-quality hay is unavailable, or if you are purchasing cattle, provide first-cutting grass-legume hay and 2 pounds of corn when cattle are first weaned or arrive in the lot. Avoid second- and third-cutting legume hay as it has the tendency to cause scours in calves. Corn silage fed with 1.5 to 2.0 pounds of a 15 to 20 percent protein supplement is also a good starting ration. Urea supplements used as a protein source are not well utilized by new cattle at the onset of a high roughage-based feeding program. Adding a broad-spectrum antibiotic during the first two to four weeks is often very effective toward reducing sickness and enhancing the rate of gain.

Supplemental vitamin A is necessary during the first three weeks. Vitamin A may be supplied in the protein supplement or by adding vitamin A to a free-choice mineral mix. The mineral mixture should consist of 1 to 2 parts of dicalcium phosphate or bone meal and 1 part trace-mineralized salt. This mixture should be replenished frequently and be available free choice at all times.

It is also important to provide adequate quantities of clean, fresh, frost-free water for calves at all times. Likewise, it is equally important to carefully observe that all calves have found the water. Discuss the use of growth promotants with your veterinarian. Heifers that may be saved for replacements should not be implanted.

Preventative Health Management

Some important preventative health management practices include the following:

- vaccinations and boosters (IBR, PI3, BRSV, and 7 Clostridial strains)
- deworming
- implantation of growth-promotants
- proper identification (ear tags)

Vaccinations should be given when purchased cattle arrive or at weaning. Vaccinate for BVD only if it is a problem in your area. It is very important that a veterinarian become involved in developing and implementing an effective preventative health program.

If possible, castration and dehorning should be done a minimum of two weeks before weaning. Purchased bull calves should not be castrated until they are acclimated and have recovered from stress. Depending on the weather, the recommended waiting period is ten to fifteen days. Deworming and treatment for external parasites should be done separately from other practices to avoid excessive stress.

Backgrounding Feeding Programs

Once calves have recovered from weaning or shipping stress (two to four weeks), they are ready to be placed in a backgrounding program. The program to be followed will depend on when the calves were born (spring or fall) and the available feedstuffs. A number of wintering rations are shown in Table 1 using various feeds that will result in different rates of weight gain.

Backgrounding Systems for Spring-Born Calves

The following four management/feeding options vary primarily in the duration of the feeding period, choice of ration, and final target weight. The condition common to all options is that 400- to 600-pound calves are weaned or purchased in the fall.

Option A
(average target weight of 740 pounds)

This option involves 30 days of grazing on fall pasture or corn crop residues followed by 165 days of winter feeding. After the winter feeding period, the calves are put on spring pasture (usually in mid-May) for fifty days, and then sold in early July.

Table 1. Suggested winter rations for backgrounding 400- to 600-pound calves.

	Ration							
Feed	1	2	3	4	5	6	7	8
	Pounds per head daily							
Grass hay (late cut)	12–14							
Ground corn cobs		10–12				7–9		
Grass-legume hay (early cut)			12–14				10–12	
Legume hay (early cut)				12–14				
Corn residue silage (65% moisture)					30–35			
Corn silage (65% moisture)						10–15		30–35
Corn grain							3–4	
Protein supplement (32% protein)[a]	1	3			2	2		2
Mineral mixture[b]	FC[c]	FC	FC	FC	FC	FC	FC	FC
Expected daily gain (pounds)	0.5	0.5	0.75	1.0	1.0	1.0	1.25	1.75

[a] The supplement should contain 15,000 IU of vitamin A per pound.

[b] Add 2 parts dicalcium phosphate and 1 part trace-mineralized salt.

[c] FC = free choice.

On fall pasture, the calves should gain 1.5 to 1.75 pounds per day. No supplemental protein or energy is required. However, if calves are grazed on corn crop residues, they should receive 1.5 pounds of a 32 percent protein supplement daily. The wintering ration could consist of the first seven rations listed in Table 1. The choice of ration depends on the feeds that you have available. Ration 8, which is a full-feed or corn silage ration, is not recommended because calves will probably be carrying too much flesh to make good use of pasture the following spring.

If calves are wintered on rations 1, 2, or 3, they should gain about 150 to 200 pounds by spring. After being wintered at this level, they should gain 1.75 to 2.0 pounds per day during the fifty days on spring pasture. Stocking rate on pasture should be about two head per acre.

Option B (average target weight of 825 pounds)

This option likewise involves 30 days of grazing on fall pasture or stubble fields. The exceptions are:

- the choice of winter ration
- the cattle are carried on pasture an additional 80 days or until early October rather than being sold in early July.

Because pasture growth and quality are reduced during the summer, daily gains on pasture will drop in most years. In this program, if supplemental grain is fed during the summer grazing season, stocking rates and growth rates are similar to those during the use of spring pasture.

The 165-day winter-feeding period uses corn silage and a protein supplement (Ration 7 or 8). Calves should gain 280 to 3,600 pounds on these rations. Thus, calves would weigh 800 to 1,000 pounds after the winter feeding period.

If you decide to feed Ration 8, cattle should go directly to a feedlot. Grain supplementation should be considered only if the cattle are being finished for slaughter or if a price premium exists for having cattle started on a feedlot ration. This program would require 2.5 to 3.0 tons of corn silage, approximately 250 pounds of protein supplement, and 20 to 30 pounds of salt-mineral mixture per head.

Backgrounding Systems for Fall-Born Calves

The following two management/feeding systems involve fall-born calves weighing 400 to 600 pounds that are weaned or purchased in June the following year. One option would be to take advantage of pasture gain for the season (June through October) and sell the animals as yearlings. The other option would be to continue feeding for low-cost gains through the coming winter and sell the cattle as heavy feeders in the spring.

Option C (average target weight of 625 pounds)

Because pasture is available after weaning, one alternative is to graze calves 160 days on pasture until late October to mid-November and sell them as feeders (yearlings) in the fall. Calves managed in this manner should gain 150 to 200 pounds during the summer and fall grazing periods, provided the pasture contains some legumes. Only a salt-mineral mixture would be required in addition to the pasture.

Option D (average target weight of 800 to 1,000 pounds)

With this option, the fall-born calves from Option C are retained and carried over the winter as long-yearlings. Because they are heavier and have more frame going into the winter than spring calves, these animals have sufficient capacity to use low-quality roughage such as corn crop residue and stockpiled grasses. Supplemental protein, vitamin A, and phosphorus would be required when grazing these lower-quality roughages. Feeding 1.5 pounds of a 32 percent supplement fortified with vitamin A and phosphorus along with the roughage should provide sufficient energy

and protein for yearling cattle to gain 0.5 to 0.75 pounds per day. When most of the dropped grains, shucks, and leaves are gleaned from corn crop residue and stockpiled grasses becomes limited, hay or other roughage should be provided for the remainder of the winter. The rations shown in Table 1 could be modified by increasing the roughage levels 25 to 30 percent to meet the requirements of the heavier-weight yearlings. Using a ration that provides at least 1.5 pounds of daily gain would result in these heavy feeders weighing 850 to 1,000 pounds and being ready for market or finishing the following spring.

Sample Budgets

Four sample budgets are included that summarize costs and returns for backgrounding beef calves. The budgets were developed for options A–D and 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*.

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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.

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

http://www.ibc.iastate.edu

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Sample Budget for Spring-Born Calves—Option A

Bought at 400 pounds and sold in early July the next year at 750–850 pounds; fed during winter and spring (800 pounds used in this example)

Item	Quantity	Unit	Price	Total per animal	Your estimate
Receipts					
Yearlings (minus 1.5 percent death loss)	788.0	pounds	$0.80	$630.40	_____
Variable costs					
Feeder calf	400.0	pounds	$0.90	$360.00	_____
Fall, spring, and summer grazing periods					
Pasture (hay equivalents)	0.5	tons	$40.00	$20.00	_____
Corn crop residue	0.2	tons	$10.00	$2.00	_____
Concentrate (32 percent)	0.2	tons	$120.00	$24.00	_____
Dry lot					
Hay (mixed grass and legume)	1.2	tons	$65.00	$78.00	_____
Concentrate (32 percent)	0.2	tons	$120.00	$24.00	_____
Salt and minerals	33.0	pounds	$0.20	$6.60	_____
Total feed cost				$154.60	_____
Health				$8.00	_____
Insurance and taxes				$0.50	_____
Marketing and trucking				$10.00	_____
Supplies and miscellaneous				$1.00	_____
Interests on operating capital				$24.21	_____
Total variable cost				$558.31	_____
Fixed costs					
Labor	2	hrs	$8.00	$16.00	_____
Buildings, fencing, and facilities				$5.00	_____
Total fixed cost				$15.00	_____
Total cost				**$573.31**	_____
Returns					
Returns above variable costs				$72.09	_____
Net returns				$57.09	_____

Net returns over variable costs selling 800-pound feeders

Prices received	$0.75	$0.78	$0.80	$0.82	$0.85
Net returns over variable cost	$33.00	$56.00	$72.00	$88.00	$111.00

Net returns over total costs selling 800-pound feeders

Prices received	$0.75	$0.78	$0.80	$0.82	$0.85
Net returns over total cost	$18.00	$41.00	$57.00	$73.00	$96.00

Initial resource requirements

- Land: 3/4 acre
- Labor: 2 hours
- Capital
  - Calves: $280
  - Buildings and equipment: $50

Sample Budget for Spring-Born Calves—Option B

Bought at 400 pounds and sold in early July the next year at 850–950 pounds; fed during fall, winter, and spring (900 pounds used in this example)

Item	Quantity	Unit	Price	Total per animal	Your estimate
Receipts					
Yearlings (minus 1.5 percent death loss)	866.5	pounds	$0.80	$709.20	_____
Variable costs					
Feeder calf	400.0	pounds	$0.90	$360.00	_____
Fall, spring, and summer grazing periods					
Pasture (hay equivalents)	0.9	tons	$40.00	$36.00	_____
Corn crop residue	0.2	tons	$10.00	$2.00	_____
Concentrate (32 percent)	0.2	tons	$120.00	$24.00	_____
Dry lot					
Hay (mixed grass and legume)	1.2	tons	$65.00	$78.00	_____
Concentrate (32 percent)	0.36	tons	$120.00	$43.20	_____
Salt and minerals	33.0	pounds	$0.20	$6.60	_____
Total feed cost				$189.80	_____
Health				$8.00	_____
Insurance and taxes				$0.50	_____
Marketing and trucking				$10.00	_____
Supplies and miscellaneous				$1.00	_____
Interests on operating capital				$41.82	_____
Total variable cost				$611.12	_____
Fixed costs					
Labor	2	hrs	$8.00	$16.00	_____
Buildings, fencing, and facilities				$5.00	_____
Total fixed cost				$15.00	_____
Total cost				**$626.12**	_____
Returns					
Returns above variable costs				$98.08	_____
Net returns				$83.08	_____

Net returns over variable costs selling 900-pound feeders

Prices received	$0.75	$0.78	$0.80	$0.82	$0.85
Net returns over variable costs	$54.00	$80.00	$98.00	$116.00	$142.00

Net returns over total costs selling 900-pound feeders

Prices received	$0.75	$0.78	$0.80	$0.82	$0.85
Net returns over total costs	$39.00	$65.00	$83.00	$101.00	$127.00

Sample Budget for Fall-Born Calves—Option C

Bought at 400 pounds the previous spring and sold in November at 625 pounds; grazed during the summer and fall.

Item	Quantity	Unit	Price	Total per animal	Your estimate
Receipts					
Yearlings (minus 1.5 percent death loss)	616.0	pounds	$0.80	$492.50	_____
Variable costs					
Feeder calf	400.0	pounds	$0.90	$360.00	_____
Summer and fall grazing periods					
Pasture (hay equivalents)	0.7	tons	$40.00	$28.00	_____
Salt and minerals	22.0	pounds	$0.20	$4.40	_____
Total feed cost				$32.40	_____
Health				$8.00	_____
Insurance and taxes				$0.50	_____
Marketing and trucking				$10.00	_____
Supplies and miscellaneous				$1.00	_____
Interests on operating capital				$18.54	_____
Total variable cost				$430.44	_____
Fixed costs					
Labor	2	hrs	$8.00	$16.00	_____
Buildings, fencing, and facilities				$5.00	_____
Total fixed cost				$15.00	_____
Total cost				**$445.44**	_____
Returns					
Returns above variable costs				$62.06	_____
Net returns				$47.06	_____

Net returns over variable costs selling 740-pound feeders

Prices received	$0.75	$0.78	$0.80	$0.82	$0.85
Net returns over variable costs	$31.00	$50.00	$62.00	$74.00	$93.00

Net returns over total costs selling 740-pound feeders

Prices received	$0.75	$0.78	$0.80	$0.82	$0.85
Net returns over total cost	$16.00	$35.00	$47.00	$59.00	$78.00

Sample Budget for Fall-Born Calves—Option D

Bought at 400 pounds in the spring and sold in spring at 850–1,000 pounds; fed during winter and spring (900 pounds used in this example)

Item	Quantity	Unit	Price	Total	Your Estimate
Receipts					
Yearlings (minus 1.5 percent death loss)	886.5	pounds	$0.80	$709.20	_____
Variable costs					
Feeder calf	400.0	pounds	$0.94	$376.00	_____
Summer and fall grazing periods					
Pasture (hay equivalents)	0.7	tons	$40.00	$28.00	_____
Salt and minerals	22.0	pounds	$0.20	$4.40	_____
Winter and spring feeding					
Stubble grazing	0.52	tons	$10.00	$5.20	_____
Hay (mixed grass and legume)	0.73	tons	$65.00	$47.45	_____
Concentrate (32 percent)	0.4	tons	$120.00	$48.00	_____
Salt and minerals	32.0	pounds	$0.20	$6.40	_____
Total feed cost				$133.05	_____
Health				$8.00	_____
Insurance and taxes				$0.50	_____
Marketing and trucking				$10.00	_____
Supplies and miscellaneous				$1.00	_____
Interest on operating capital				$40.70	_____
Total variable cost				$569.25	_____
Fixed costs					
Labor	2	hrs	$8.00	$16.00	_____
Buildings, fencing, and facilities				$5.00	_____
Total fixed cost				$15.00	_____
Total cost				**$584.25**	_____
Returns					
Returns above variable costs				$139.95	_____
Net returns				$124.95	_____

Net returns over variable costs selling 900-pound feeders

Prices received	**$0.75**	**$0.78**	**$0.80**	**$0.82**	**$0.85**
Net returns over variable cost	$96.00	$122.00	$140.00	$158.00	$184.00

Net returns over total costs selling 900-pound feeders

Prices received	**$0.75**	**$0.78**	**$0.80**	**$0.82**	**$0.85**
Net returns over total cost	$81.00	$107.00	$125.00	$143.00	$169.00