

SYSTEMS OF BEEF CATTLE PRODUCTION



Systems of commercial beef cattle production may be divided into three general categories: (1) the cow-calf segment which produces weaned feeder calves for further grazing and/or feeding, (2) the backgrounding or stocker phase of production in which body weight is added to recently weaned calves, resulting in feedlot-ready yearlings and (3) the finishing phase of production in which cattle are fattened for slaughter.

The cow-calf and backgrounding categories are best suited for Arkansas conditions. Both calf and yearling production utilize forages as the primary feed. The climate, soil and terrain in Arkansas are well suited for forage production. Many cattle producers view their cattle enterprise as a way to market forage, their greatest resource.

In contrast to feeder calf and stocker production, finishing cattle for slaughter requires large amounts of feed grains and a relatively dry climate. Feed grain production in Arkansas is not sufficient to finish large numbers of cattle. Large quantities of feed grains are shipped in from other states to supply the poultry and swine industries. Furthermore, the Arkansas climate is not well suited to cattle feeding due to excessive rainfall and accompanying mud in the winter, and high heat and humidity in the summer. Situations do exist in which cattle can be profitably finished in Arkansas, but it is generally more efficient to transport feeder and yearling cattle from Arkansas to cattle-feeding states where feed is more abundant and the climate is more desirable for finishing cattle.

Cow-Calf Phase (Feeder Calf Production)

In 2003, Arkansas had 949,000 beef cows on approximately 30,000 farms. Feeder calf production provides a supplemental source of income for many Arkansans. Although certain parts of the year (e.g., calving season and fall roundup) can be relatively labor intensive, a minimum amount of labor is generally required.

Two important factors that affect the profitability of a cow-calf enterprise are (1) calf crop percentage and (2) calf weaning weight. Together, these two factors represent reproductive efficiency of a herd, which is defined as the total number of pounds of calf weaned divided by the number of cows exposed during the breeding season. The following table illustrates the influence of calf crop percentage and weaning weight on productivity of any given herd.

Calf Crop Percentage	Weaning Weight		
	600	500	400
100	600	500	400
95	570	475	380
90	540	450	360
85	510	425	340

Calf crop percentage varies widely throughout Arkansas. Overall, calf weaning weights have increased over the last several years; however, improving reproductive performance and thus calf crop percentage presents a larger challenge. Calf crop percentage is affected more by herd management than by individual animal performance traits.

The failure of cows to become pregnant and the loss of calves at or shortly after parturition are the leading causes of low calf crop percentages. Proper nutrition during late gestation and during the early postpartum period has a tremendous impact on conception and pregnancy rates of cows. Likewise, close observation and timely intervention and management can greatly reduce the number of calves lost during the calving season.

Cow-calf producers should strive for at least a 90 percent calf crop, and an emphasis should be placed on cows delivering a live calf every 12 months. Cows that calve at intervals greater than 12 months are usually not profitable.



FIGURE 6. Typical crossbred cow.

Feeder calves that typically bring a premium price at cattle auctions are medium- to large-framed, #1 muscled, crossbred calves. The following types of calves are usually discounted at the market: light-muscled calves with poor structure and conformation, calves that are too small

(early-maturing) or too large (late-maturing), calves with too much flesh, straightbred calves and calves with horns. Also, steer calves are usually 10 cents per pound higher than heifer calves and 3 to 5 cents per pound higher than bull calves.

The ideal time of year for calving season in any given cow-calf operation depends on the forage and/or feed supply, available labor and the intended marketing dates. More important than the time of calving season is a controlled, scheduled calving season (60 to 90 days), as opposed to a year-round calving season. With a controlled, scheduled calving season, (1) most herd management practices can be performed at the same time, (2) use of time and labor can be more concentrated and efficient, (3) slow- or non-breeding cows can be more easily identified and (4) a more uniform calf crop can be produced.

In Arkansas, most calves are born in late winter or spring and marketed in the fall. Late winter calving fits a slack labor period on most farms, and this system makes use of abundant summer pasture. Cows are on pasture during the breeding season; thus forages are heavily utilized. Also, in this system most cows are non-lactating and thus have their lowest nutritional requirements in mid-winter (a point in time when feed costs are highest). The demand for calves to graze winter annual pasture is usually strong in the fall, but this is also when most feeder calves are marketed, so calf prices often weaken during the fall.

Fall calving is better suited for some operations. In this system, calves are born in mid to late fall and marketed anywhere from late spring to early summer. Calves are old and large enough by spring and early summer to utilize grass pastures. Fall calves are typically heavier at weaning than spring calves, but the greater cost of feeding a lactating cow (the stage of production where her nutrient requirements are highest) through the winter may offset any additional value in the heavier calf. Also, fall calving may interfere with harvesting field crops on some farms.

Maintenance of accurate and complete records is an often overlooked but yet an important part of cow-calf management. These records should include calving dates, calving intervals, production costs and proper identification of cows and calves so that calf weaning weights can be traced back to each dam. Participation in the University of Arkansas Cow Herd Performance Testing Program is one means of maintaining good cow records. Information about this program is available at county Extension offices. Commercial computer software is also available that is specifically designed for record keeping in cow-calf herds.

The successful cow-calf operation depends on permanent pasture or other low-cost roughage for feed. To optimize production, other recommended management strategies such as the use of growth implants, ionophores, dewormers, etc., should be followed.

Backgrounding Phase (Stocker Cattle Production)

Backgrounding may be most often defined as the process of growing and developing calves from weaning weights (450 to 600 lb) to yearling weights of 700 to 850 lb when the cattle are ready to enter a feedyard for finishing. As a rule, starting with lighter, thinner calves is more profitable. Basic principles involved in backgrounding beef cattle are (1) adding 200 to 300 pounds of weight per calf, (2) extensive and intensive use of high-quality forage rather than the more expensive high-energy feed sources, (3) assembly of calves into more marketable groups – uniformity in breeding, sex, weight and quality and (4) more marketing flexibility for calf/yearling owners. The backgrounding phase usually represents a period of efficient, predominantly lean growth.

Arkansas' forage resources make it well suited for backgrounding cattle. There is tremendous potential for winter grazing either wheat, rye, rye-grass or combinations thereof. Young calves that have just been weaned perform well on high-quality forage. Fescue provides a good permanent winter pasture but must be supplemented with grain for stocker calves to make adequate growth. Average daily gains from 1.5 to 2.25 lb/day should be targeted in a backgrounding operation.



FIGURE 7. Typical feeder calves.

Several variations of production systems exist for producers. Some cow-calf producers may choose to sell their heaviest calves at weaning and background their lighter calves (in addition to purchased light calves) to heavier weights before selling them. This option spreads out cash flow and market risks.

Other backgrounding systems besides the more standard fall to spring method include a program in which fall-weaned calves are “roughed” through the winter with minimal inputs and costs, then placed on spring and summer pasture where they achieve efficient, compensatory growth and then marketed in the fall. “Pay day” is delayed with this system, but it makes good use of summer pasture.

While most backgrounding operations utilize grass for feed, some producers (especially in the major cropland areas of Arkansas) develop calves on harvested forages. For example, hay or corn silage, when supplemented with the necessary grain and protein supplement for a balanced ration, can be fed to enable calves to grow, but not fatten. The cost of gain in this type of program is typically higher than when the cattle are allowed to harvest forage; however, when grain prices are low, this approach has some merit.

Finishing/ Feedlot Phase

Cattle are usually finished for slaughter confined in a drylot on full feed with grain and limited roughage. Cattle usually go on feed as yearlings weighing 700 to 850 lb, average gaining 3 lb or more per day in the feedlot and finish weighing between 1,000 and 1,300 lb. Most cattle feeders strive for a finish sufficient to grade U.S. Choice. The feeding period often spans 150 days, although large-framed, late-maturing cattle require a longer period and small-framed, early-maturing cattle finish sooner.

Calves that wean at heavy weights (650 to 750 lb) may be placed directly into the feedlot and finished for slaughter over a 180- to 200-day period. The finishing ration is usually altered for calves to include more roughage and less concentrate early in the feeding period, but working up to high concentrate feeding during the last 120 days.

Some Arkansas producers have had success finishing cattle with grain while they are still on pasture (i.e., “grain on grass”). This system typically does not achieve the high degree of finish that is attained in the feedlot since roughage consumption is difficult to control and the cattle expend energy during movement within the pasture.

The Purebred Herd

Purebred herds are important for providing breeding stock to commercial cattle producers. Purebred cattle production is a long-term endeavor. Progress in beef cattle improvement

through selection and culling is slow. Many top purebred breeders have been in business over 20 years.

The successful purebred breeder should have a good understanding of animal breeding and nutrition and be dedicated to improving the breed. Progressive purebred breeders use artificial insemination, EPDs (expected progeny differences), cow herd performance records, performance test young bulls, obtain carcass data on offspring of sires, ultrasound scan yearling cattle for carcass measures and, in some cases, utilize embryo transfer and cloning.



FIGURE 8. Purebred Simmental bull calf.

Breeding purebred cattle requires a greater capital outlay to get established and more money to operate than a commercial herd. Bulls suitable for herd improvement are often more costly to buy. The value of the average cow and the cost to properly raise and develop purebred calves are greater than in the commercial herd. Advertising to attract potential buyers is an expense purebred breeders have that is rarely a part of commercial production. In addition, purebred breeders must maintain extensive pedigree and performance records for the buyers' use in selection. Facilities must be attractive and well kept to display the cattle well. Maintaining a high level of customer service is also essential in building a strong customer base.

A person entering purebred cattle production should consider the expense, the long-term requirements and exacting demands of purebred cattle production. These considerations should be balanced against greater financial returns, personal satisfaction and possible prestige in a successful purebred business.