Drylot vs. Pasture Beef Cow/Calf Production – 3-year Progress Report

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Introduction

The availability of grazing land for beef cattle is diminishing in some parts of the country. A variety of factors contribute to this trend including conversion to cropland for grain production, drought, alternative uses such as urbanization and recreation, and environmental regulations. Alternative systems of beef production have gained attention in intensively cropped areas to maintain beef cow numbers and support diverse and biologically sustainable agriculture.

Procedure

Mature crossbred, spring-calving Red Angus x Simmental beef cows (n=80) and their calves were randomly allotted by calving date to one of two management system treatments, 1) drylot production or 2) pasture production. Cows assigned to respective treatments in year 1 stayed in that group in subsequent years. In the spring, pasture cows and calves were placed on a mixed-grass pasture and grazed for approximately 6 months. Pastures were stocked at one pair per six acres and were composed primarily of bluegrass and a variety of native warm-season grasses. Drylot cows and calves were housed in south sloping dirt pens with approximately 1200 sq. feet per pair and 2 feet of fenceline bunk per cow. Drylot cow diets were formulated with a variety of feeds based on availability, nutrient content, and price. Formulations varied by year. Primary ingredients included crop residues (wheat straw, pea straw or corn stover) and co-products, (distillers grains, wheat middlings, barley hulls, and various grain screenings) corn silage and grass hay. Feeds were tested and diets formulated to meet or exceed NRC (1996) nutrient requirements for mature lactating beef cows of average milking ability. A portion of the ration was delivered as a totally-mixed ration in fenceline bunks with free choice stover offered in round bale feeders. Salt and minerals were supplemented free choice to the pasture cows and included in the mixed ration for drylot cows. Creep feed, formulated to be 16 percent crude protein, was offered to both groups of spring-born calves beginning on the same date each year. Drylot calves were provided grass hay in the creep.

All cows were exposed to natural service sires during a 45-day breeding season at a ratio of one bull per 20 cows. Cows were culled for infertility or unsoundness and replacements were added prior to pasture turn out each year at the cull rate for each treatment. Weaning occurred at different times for the two production systems. Drylot calves were weaned in late September and pasture calves were weaned in late October. At weaning calves were placed on a growing ration (47 Mcal, NEg /lb) in the feedlot. After weaning, drylot cows grazed crop aftermath and regrowth, when available, and pasture cows remained in the pasture until late November or winter weather conditions dictated cows be returned to a pen environment at the Research Extension Center. Mid-gestation and late-gestation rations were similar for each treatment group. Feed cost estimates reflect actual costs for purchased feeds and production costs for farm-raised feeds as reported by the North Dakota Farm Business Management program participants across North Dakota (Metzger and Hanson, 2012). Yardage was billed at $0.35 per hd per day for cows in drylot during the summer. Pasture rent was $20 per acre in years 1 and 2 and $25 per acre in year three. Expenses for hauling cattle to and from pasture, fencing materials, labor, and mileage for checking cows bi-weekly were included in the pasture-cost calculations. This project has been approved by the NDSU Animal Care and Use Committee.

Results and Discussion

Cow weight change varied by production stage, (Table 1) with an average advantage of 40 pounds for pasture cows over drylot cows from turn out in late May to winter penning in early December. Several factors may affect weight difference, including the nutrient density of the diet offered to drylot cows or the quality of aftermath grazing compared to the seasonal quality variation for grazing cows. Even though drylot cows lost 105 pounds from late May to the end of breeding season compared to 54 pounds for pasture cows, conception rates were similar at 84.2 and 85.2 percent, respectively. Little difference in weight change was observed for cows from the end of breeding season until drylot calves were weaned in late September. Drylot cows gained more weight (65 pounds) after calves were weaned than pasture cows still being nursed (27 pounds).

The average calf birth date was two days later for drylot calves. Fourteen percent of drylot cows were assisted during parturition compared to 5.3 percent for pasture cows. Pasture calves gained more weight from turn out in late May to late September (388 pounds) than drylot calves (348 pounds) (Table 1). Drylot calves consumed 653 pounds of creep feed per head while pasture calves, although nursing longer, consumed 806 pound. Drylot calves placed in the feedlot at weaning in late September until late October when pasture calves were weaned gained 96 pounds vs. 90 pounds for pasture calves still nursing and consuming creep feed.

Table 1. Beef cow/calf performance from drylot or pasture production systems.

Item	Drylot (DL)	Pasture (PSTR)
Cow weight, lb		
Turn out (TO), late May	1516	1508
Winter pen (WP), early Dec	1445	1475
Change, TO to WP	-71	-33
Conception, % (45 d nat svc)	84.2	85.2
Calf data		
Birth date	1-Apr	30-Mar
Sex ratio, 1=H, 2=B	1.45	1.58
Percent assisted	14.0	5.3
Calf weight, lbs		
Birth	95.5	94.1
TO, late May	222	228
DL weaning in late Sept	571	617
Gain	349	389
PSTR weaning in late Oct	667	707
Gain, DL wn to PSTR wn	96*	90
Gain, birth to PSTR wn	572	613

* Drylot calves were weaned and in the feedlot during this time.

Feed costs were higher for lactating drylot cows ($1.72/head/day) compared to pasture cows ($1.00/head/day). A pasture rental rate of $43/acre would be equal to the drylot feed costs. Grazing crop aftermath during mid-gestation decreased drylot cow costs. A partial budget (Table 2) indicates annual feed costs were higher for drylot cows ($518.91/cow) than pasture cows ($456.98/cow), even with more creep feed consumed by pasture calves ($100.51/calf) vs. drylot calves ($84.19/calf). Total feed cost for drylot pairs was $600.13/pair while the feed

expense for pasture pairs was $557.49/pair. Drylot cows were charged $0.35/hd/day for yardage which includes feed delivery, pen depreciation, and water. Manure produced by drylot cows is credited as fertilizer for the crops based on prices for N, P, and K (Table 2). The net cost/pair/year totaled $580.13 for drylot pairs and $557.49 for pasture pairs. The cost per pound of weaned calf was $0.23 lower for pasture cows in this study. The difference in weaning time (late September vs. late October) and weaning weight (571 pounds for drylot vs. 707 pounds for pasture) may affect market price with an advantage to lighter calves, reducing the net difference in the two management systems.

Table 2. Partial budget for drylot vs. pasture beef cow/calf production.

	Drylot	Pasture
Annual cost/cow, $ *	518.91	456.98
Creep feed, cost/calf, $	84.19	100.51
Subtotal, cost/pair/yr, $	600.13	557.49
Summer drylot yardage @ $0.35/hd/day	40.02	-
Manure (NPK) value, $/drylot cow per summer	67.13	-
Net cost/pair/year	580.13	557.49
Cost/lb calf weaned, $ **	1.02	0.79

* Includes aftermath grazing in two of three years (avg 20 d/yr) for drylot cows and all feed and other costs for grazing pairs.

** Drylot calves weaned late September, pasture calves weaned late October.

Management practices that can potentially improve the performance and economics of drylot beef production need to be explored. The nutrition and performance of lactating beef cows and calves in drylot is dependent on the manager. The economic success of a drylot production system is based on optimum care of the animals and competitively-priced feeds.