Three Management Regimes for Drylot Cow/Calf Production

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The drylot or confined cow/calf enterprise is a viable alternative management system for marketing forage, feeds and crop residues through a cow herd. Low feed prices, available breeding cattle, labor, facilities and equipment may lead farmers to consider a drylot or partial drylot beef cow/calf enterprise. This may spread economic risk and increase marketing flexibility for farm-raised feeds. Granted, the drylot cow herd will not replace the grazing ruminant but can complement the more traditional beef cow operation in addition to capitalizing on good management. The drylot cow herd differs from a feedlot where animals are fattened for slaughter in that lactating cows and calves are kept in a small pen all summer and fed harvested feeds. Cows are bred and cared for much the same as cows in pasture. Calves are offered a moderate energy creep feed to supplement their dam's milk.

The drylot beef cow enterprise has some advantages. Capital investment in land per cow unit is substantially lower (Ewing et al., 1959). More sophisticated breeding programs can be employed with better exposure of natural service sires. Closer observation is possible at daily feeding. Relatively easy confinement of animals for early treatment of any detected problems helps reduce death loss and disease problems. Weaning stress is minimized due to calves feed bunk and waterer familiarity. Weaning day amounts to chasing the cows out of the pen onto a small grain stubble field or other residue grazing. Wider variation in ration ingredients may be possible, including crop residues and other low value forages. Attrition due to natural causes such as lightning and predators is reduced (Marion et al., 1968). Economic risk is spread over more enterprises on farms that cannot support grazing livestock. Irrigation adds to the production efficiency by stabilizing the feed supply and improving feed quality with fewer total acres dedicated to feed production (Dunn and Olson, 1978).

Disadvantages must also be considered. More labor and equipment are needed to support a drylot cow/calf enterprise. Feed costs tend to be higher. Disease and health problems can be serious if not treated promptly and effectively. A higher level of management is required to keep cows pregnant, productive and healthy.

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Calves get accustomed to bunk feeding early in life.

Producer interest varies with the proportion of tillable land, land value, beef prices, feed costs and availability. Farmer-cattlemen with highly productive farmland and limited non-tillable acres may benefit the most from drylot cow/calf enterprise. Research reports from several states and Canada show mixed results for drylot vs pasture or range production in terms of weaning weight and reproductive performance. Most reports agree that in drylot, cows are more responsive to management. In other words, good management results in substantially higher performance than poor or mediocre management. Efficiency of production in terms of pounds of beef per acre strongly favors the drylot cow/calf enterprise (Dunn and Olson, 1978). Harvest efficiency is 90 to 95 percent for machines vs a highly variable 45 to 65 percent for grazing animals. Crop selection is more flexible with drylot beef cows. Maximum energy production per acre is achieved with corn grown for silage. Previous work at this station compared irrigated pasture with drylot cow/calf production. Results strongly suggest the drylot cow/calf enterprise is more efficient (Dunn and Olson, 1978). Minnesota work suggests that twice as many cows could be carried on the same number of acres with drylot (Meiske and Goodrich, 1968). An economic comparison of drylot cow/calf production with irrigated pasture and modeled

traditional range cow/calf operation revealed lowest breakeven prices for weaned calves produced in drylot ($.79) followed by irrigated pasture ($.99) and traditional range management ($1.12) (Anderson and Meyer, 1983).

Little research exists on variations in drylot rations or management alternatives. Wyatt et al. (1977) evaluated two energy levels for lactating drylot Hereford and Hereford × Holstein cows. Straightbred Holstein cows were evaluated at three energy levels. Hereford cows, on moderate energy diets, required 9.91 pounds of forage per pound of weaning weight while Hereford cows on high energy diets required 10.99 pounds. Hereford × Holstein cross cows needed 10.96 pounds on moderate energy diets and 10.02 on high energy diets to produce a pound of weaning weight. Holstein cows on moderate, high and very high diets produced a pound of weaning weight with 10.29, 11.44 and 11.27 pounds of forage, respectively. Michigan researchers found no difference in cow and calf performance when they compared corn silage with urea vs corn silage with natural protein for drylot cows (Ritchie and Nales, 1969).

This article summarizes a three-year summer drylot management study with three management regimes closely related to cow diet at the Carrington Irrigation Station Livestock Unit.

MATERIALS AND METHODS

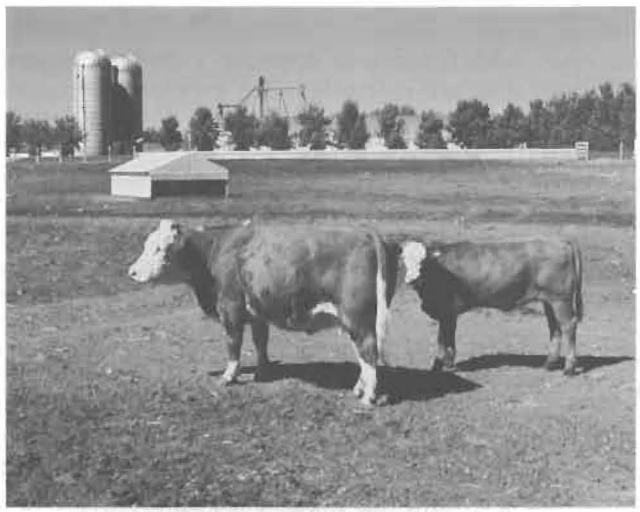
Lactating drylot cows at this station have been offered a daily diet of 35 lb. corn silage and 15 lb. chopped alfalfa hay in previous trials. This ration was used as a control (see table 1). Treatment 2 (super management) rations consisted of 40 lb. corn silage, 15 lb alfalfa hay with 2 oz. phosphorus and 1000 I.U. Vitamin A between calving and breeding. Calves in this treatment group were allowed to creep graze a previously harvested bromegrass hay meadow. Creep grazing was evaluated previously as having potential benefit to drylot cow/calf production by reducing creep feed intake and improving calf gains (Anderson, 1983). Cows and calves also had access to slotted shade during the trial. Treatment 3 (residue) ration included free choice cereal grain straw for cows in addition to 40 lb. of corn silage and 3-5 lb. of protein supplement. Barley or sunflower meal were used based on least cost protein. Rations were based on NRC Nutrient Requirements for Beef Cattle (1976) for cows of average milking ability. Trace mineral medicated salt and a mineral mixture to provide the correct calcium to phosphorus ratio were separately offered free choice.

Table 1. Rations for Drylot Beef Cattle (Pounds/Head/Day).

	Control	Super	Residue
Corn Silage	35	40	40
Alfalfa/Grass Hay	15	15	—
Straw	—	—	6[1]
Protein Supplement			3-5[2]

1. Offered free choice, estimated consumption.
2. Sunflower meal at 3 lbs/day or rolled barley at 5 lbs/day based on least cost protein.

Straightbred Hereford cows were randomly allotted each year by birth date of calf and breed of sire to one of the three treatments. Hereford, Red Angus and Tarentaise sires were used in approximately equal numbers in both artificial and natural matings. Nine to 12 sires were represented in each breed. Cows and calves were weighed at the start of the trial in mid-May and at the end of the trial in mid-September when calves were weaned. Weight gains/losses, rebreeding performance and feed costs were compared. Breeding commenced on June 6 with 21 days of heat detection and artificial insemination. Clean up bulls were turned in for the remainder of the 45-day breeding season. Natural service sires were rotated between treatments each year. No replacement females were added to the herd during the trial.



Hereford cow with crossbred calf in drylot.

Creep feed was offered starting about June 1 each year. The creep ration for all calves consisted of 50 percent chopped alfalfa hay and 50 percent rolled oats or barley. Self feeders designed for high forage rations were used in each pen.

Calves were vaccinated for protection against IBR, BVD, PI3 and the clostridial complex including blackleg, malignant edema and enterotoxemia prior to the start of the trial. Bull calves were castrated at birth. All calves were implanted with Ralgro at the start of the summer trial. Calves were monitored closely for scours and respiratory disease and treated promptly. One calf died from pneumonia during the three-year trial.

RESULTS AND DISCUSSION

No statistical differences were detected in the weight change of cows or calves in this trial. Large variations in weight change between individual cows reduced the ability to detect differences. Little difference in calf gains was evident (see table 2). Super calves tended to gain faster at 2.27

Table 2. Cow/Calf Performance in Drylot 1982-1984.

	Control	Residue	Super
Number of Pairs	92	92	93
Cows			
Start Weight (Lb)	1090	1096	1084
End Weight (Lb)	1122	1116	1136
Avg. Gain (Lb)	32	20	52
Calves			
Start Weight (Lb)	147	153	148
End Weight (Lb)	404	412	418
Avg. Gain (Lb)	256	258	271
Avg. Daily Gain (Lb)	2.16	2.18	2.27

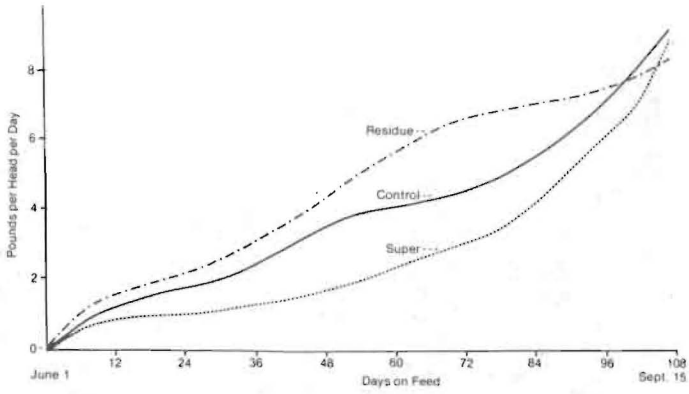


Figure 1. Calf Creep Feed Consumption by Management, 3-Year Summary.

lb. per day while the control and residue calves gained 2.16 and 2.18 lb per day, respectively. Cow gains were more variable with super cows gaining 52 lb. during the trial, control cows gained 32 lb. and residue cows gained 20 lb. Cows on the residue ration ate approximately 6 lb. of straw per day. These cows tended to shed their hair sooner and looked heavier than cows on the other two treatments. The high heat increment of straw and the physical bulk of the ration probably contributed to these observations.

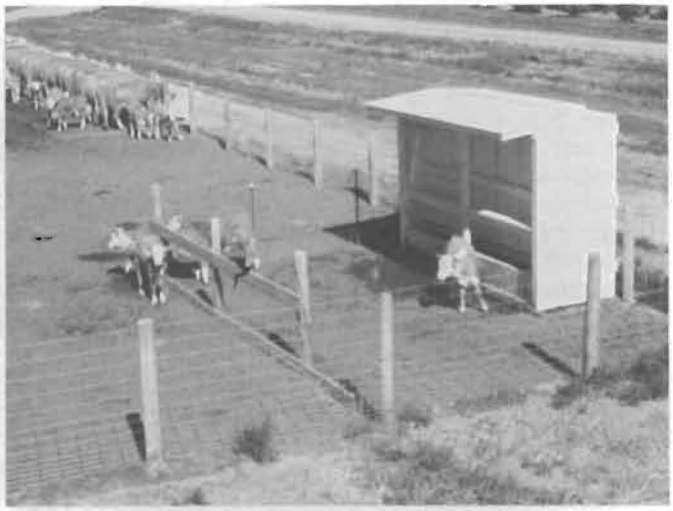
Creep feed consumption (see figure 1) was lowest for super calves, averaging 2.55 lb. per head per day. Residue and control calves not having access to the creep pasture ate 4.05 and 3.48 lb. per head per day, respectively. The figure graphically portrays increasing consumption from approximately June 1 to mid-September. At the end of the trial, calves in all treatment groups were eating 8 to 9 lb. per head per day. In addition to creep feed consumption, calves were eating corn silage and chopped hay at the bunkline with their dams. Being accustomed to feed intake at this level helped reduce stress for these calves weaned in mid-September at an average of 165 days of age.

Reproductive performance (see table 3) tended to favor the control cows. The average calving day for control cows was the same in successive years. Ten percent of the control cows were open at fall pregnancy testing. Super cows calved an average of two days earlier each year. However, 14 percent of the cows in the super and residue groups were open on fall pregnancy diagnosis. Residue cows tended to calve later, falling an average of six days behind each year. All factors considered, cows on the control ration exhibited the best reproductive performance. Ten percent open cows may be too high, but the normal replacement rate of 16 percent still allows some culling for production and death loss. The 14 percent open cows in the super and residue groups is higher than most producers would accept. The short breeding season and missed conceptions from artificial insemination may have contributed to lower reproductive performance. No other criteria can be identified for explaining the higher number of open cows in the super managed group. First service conception averaged 64 percent over the three-year study with no differences between treatments.

Table 3. Reproductive Performance of Drylot Beef Cows (3-Year Summary).

	Control	Super	Residue
Number of Head	92	92	93
Number Open	9	13	13
% Open	10	14	14
Avg. Calving Date[1]	0	+ 2	− 6

1. + Moved calving date up from previous year.
− Dropped calving date back from previous year.



Creep feeder used for high forage rations.

Feed costs for the summer trial were identical for super and residue cow/calf pairs at $105.91. Control pairs feed cost was $99.96. Values used to calculate feed costs and breakdown to cow and calf feed costs are given in table 4. Some may consider the feed cost high, but pricing farm raised feed is not an exact science. Looking at the return to farming (feed production enterprise) and considering the beef cow as a marketing tool changes the perspective. A breakeven situation for the beef production enterprise may return more net income to the total farm than marketing feeds, forages and residues in a highly volatile market.

Super managed calves on creep pasture.

Free choice straw for cows on residue management.

Table 4. Feed Costs[1] for Summer Drylot Beef Cows and Calves (3-Year Summary).

	Control	Super	Residue
Cows:			
Feed Cost/hd/day ($)	.71	.79	.74
Calves:			
Creep Feed Cost/hd/day ($)	.13	.10	.15
Total Feed Cost/Day ($)	.84	.89	.89
Total Feed Cost/Summer (119 days) ($)	99.96	105.91	105.91

1. Feed costs based on the following prices:

Oats@$1.50/Bu.	Alfalfa/Grass Hay@$50.00/Ton
Barley@$2.50/Bu.	Sunflower Meal@$185.00/Ton
Corn Silage@$20.00/Ton	Straw@$25.00/Ton

Cattle offer farmers the opportunity to convert immature, damaged or otherwise low value products to salable beef. Early weaning and longer aftermath grazing reduces feed costs and allows the cows to get into better condition before winter.

CONCLUSIONS

Combining some of the management techniques in each of the treatments evaluated may result in the optimum combination. The control ration appears to be as productive in cow and calf gains and reproductive performance as the others at a lower feed cost. Offering calves a creep pasture would further reduce feed costs. It may be possible to reduce the amount of hay fed to approximately 8 to 10 lbs. of good quality alfalfa and offer cows cereal grain straw free choice to increase use of crop residue and further reduce feed cost.

Optimum cow type remains a question for the drylot enterprise. Further work at this station will attempt to answer if it is more practical to use low milking, easy fleshing British type cattle with emphasis on reproductive performance and growth or to emphasize maternal traits and a higher level of milk production that could be supported with high quality irrigated corn silage and alfalfa hay. The rest of the cow year, from weaning to calving, may in the long run determine if the beef cow enterprise is profitable. Including large amounts of otherwise unsalable residue with high quality irrigated or dryland forages would be a practical approach.

The realistic application of a drylot cow/calf enterprise may incude a partial drylot during critical management periods such as breeding season or preweaning. Most producers operate a modified drylot program for winter feeding. Some extra effort could improve the beef production potential of the farm when managed in harmony with the other enterprises.

Literature Cited

Anderson, V.L. 1981. Beef Production with Irrigated Forage. Carrington Irrigation Station Livestock Unit Field Day Proceedings. Page 7.

Anderson, V.L. and R.F. Meyer, 1983. An economic comparison of three beef production management systems. North Dakota Farm Research, Vol. 40 No. 6, Page 14.

Dunn, Barry H. and H.M. Olson, 1978. Cow/calf beef production with irrigated forages. North Dakota Farm Research Vol. 36, No. 1, page 13.

Ewing, S.A., W. Burroughs, W. Woods and C.C. Culbotson, 1959. Feeder calf production under corn belt conditions. Iowa State College Animal Husbandry Leaflet, 247.

Marion, P.T., S.P. Hammack and J.K Riggs, 1969. Performance of beef cows managed in drylot and on pasture with varying winter energy levels. Texas Agricultural Experiment Station Report.

Meiske, J.C. and R.D. Goodrich, 1968. Drylot vs conventional cow/calf production. University of Minnesota Beef Cattle Feeders Day Research Report, B-118.

National Research Council, Nutrient Requirements of Beef Cattle, Fifth revised edition, 1976.

Ritchie, H.D. and J.R. Nales, 1969. Summer drylotting of beef cows in Michigan. Michigan AH-BC-689.

Wyatt, R.D., K.S. Lusby, J.V. Whiteman, M.B. Gould and Robert Totusok, 1977. Performance of 4 and 5-year old Hereford, Hereford × Holstein and Holstein cows on range and in drylot. J. Ani. Sci. 45:1120.