Drylot Wintering of Range Cows—
Adaptation to the Ranching Operation

JOSEPH L. SCHUSTER AND ROBERT C. ALBIN
Assistant Professors of Range Management and Animal Husbandry, Texas Technological College, Lubbock.

Highlight
Pregnant range beef cows adjusted to drylotting on all-concentrate grain sorghum rations and then readjusted to native range. Weight changes and reproductive performance on a limited all-concentrate ration compared favorably with commonly used methods of wintering the cow herd. Costs for two drylot methods were higher than for two pasture methods.

The progressive rancher always looks for ways to cut cost without reducing production. He also looks for ways to improve his range. Drylotting offers one way of doing both. Recent work on drylotting with silage (Marion et al., 1965) and with all-concentrate rations (Thomas and Durham, 1964) indicates the possibility of integrating either of these drylot techniques into the ranching operation.

In a five-year study, Marion et al. (1965) found that drylotting a cow herd with sorghum silage and grain compared favorably with maintaining a cow herd on native range throughout the year. Their studies suggest that drylotting can be successfully integrated into the ranching operation to increase ranch production without increasing ranch size.

Thomas and Durham (1964) reported studies which show distinct advantages of limited feeding of all-concentrate rations for cattle maintenance. They pointed out possibilities of integrating all-concentrate feeding into the ranching operation, the need for further study of all-concentrate feeding, and its place in ranching operations.

The cost of grains is often such that net energy obtained per dollar spent for concentrate feed, such as sorghum grain or corn, may be greater than for roughage. Ellis (1965) reviewed recent developments in the use of all-concentrate rations in commercial feedlots. The pros and cons of all-concentrate feeding are about evenly divided, and in the final analysis economic factors will determine whether roughages or concentrates should be used. When local surpluses of grains occur, maintenance rations of concentrates may be cheaper than roughage rations.

Too, the ease of handling and transporting concentrated feed-stuffs give them a distinct advantage for isolated ranchers. Because of these factors, more information is needed on the adaptability of range cattle to all-concentrate feeding.

This study was designed to determine whether pregnant beef cows could be wintered successfully on limited all-concentrate rations and whether they could readjust back to the native range environment. The drylot technique was compared with commonly used methods of wintering the brood cow herd.

Procedures
The study was initiated on November 30, 1964 on the Edwin Forrest Ranch, Slaton, Texas. The 144 grade Hereford cows used for the study were maintained on a sorghum (Sorghum vulgare Pers.) stubblefield for 45 days prior to beginning the study. After an overnight shrink the cattle were weighed, tagged individually, and randomly separated into four groups of 36 each.

The following feeding treatments were established:
1. Pasturing on native range supplemented with 1.0 lb. of 20% protein range cubes per head daily (native range).
2. Pasturing on a combination of sorghum stubble and wheatfield (stubble-wheatfield).
3. Drylotting on sorghum silage supplemented with 0.75 lb. sorghum grain and 0.75 lb./head/day cottonseed meal (silage).
4. Drylotting on an all-concentrate ration (all-concentrate).

Under the native range treatment the cattle had access to 640 acres of native range. In addition, they were fed 1.0 lb. of 20% range cubes per head per day, plus free choice of salt and mineral supplement.

The cattle on the stubble-wheatfield treatment had access to sorghum stubble from December 1, 1964 to January 7, 1965 and green wheatfields from January 7 to March 26, 1965. A salt and mineral supplement was provided free choice.

The silage ration consisted of free choice sorghum silage plus 0.75 lb. sorghum grain and 0.75 lb./head/day cottonseed meal. The feeding for this treatment was contracted to a local feeder. After the first 60 days chopped hay (about 30% of the ration) was included in the ration to decrease milk production of the cows and in turn, prevent scouring of the newly born calves.

The all-concentrate ration consisted of 82.5% irrigated-sorghum grain, 7.5% cottonseed meal, 5% dehydrated alfalfa, and 5% premix. The premix contained enough vitamin E to furnish three international units (I.U.)/lb. of ration; enough vitamin A to yield 70,000 I.U./head daily; vitamin D 9,000 I.U.; Aureomycin 70 mg.; and salt 0.11 lb., on a 9 lb./day ration.

After two weeks, two cows were removed from the all-concentrate treatment because they did not adjust to the ration and total feed increased to 9.5 lb./head/day of all-concentrate ration. After calving began, 2 lb. of whole cottonseed were added to the daily ration for each cow to provide an extra source of fat for the lactating cows. Increasing fat content of the all-concentrate ration had been observed to increase calf livability. The calves were creep-fed alfalfa hay and a mineral-salt mix.

Sampling of the feedstuff for all treatments was conducted during the feeding period. At the conclusion of the feeding period data were collected on reproduction, milk production, fat deposition, and calf livability.

of the feeding period on March 26, 1965 (116 days), all cows were weighed individually and placed on native range for the summer grazing period. Bulls were introduced on April 1 for 90 days. At weaning, November 29, 1965, all cows were weighed individually and checked for pregnancy.

We wish to express our thanks to the Grain Sorghum Producers Association, Amarillo, Texas, for contributing the sorghum grain; to Wil- hur-Rills Company, Lubbock, Texas, for supplying the ration premix; and to Mr. Edwin Forrest, Lubbock, for use of his ranch facilities, cattle and feed for all except the all-concen-

trate ration. Thanks are also due to G. W. Thomas, Dean of Agriculture; to R. M. Durham, Professor of Animal Husbandry; and to T. W. Box, Professor of Range Management, for their invaluable guidance and assistance.

Results and Discussion

The chemical contents of the feedstuffs used in the study were considered average for the South Plains region (Table 1). The 640-acre native range pasture was about half sandy-upland site and half sandy-bottomland site. The principal species on the sandy upland site were bluegrama (Bouteloua curtipendula (Michx.) Torr.), buffalograss (Buchloe dactyloides (Nutt.) Engelm.) and threeawns (Aristida spp.), sand sagebrush (Artemisia filifolia Torr.) and honey mesquite (Prosopis glandulosa Torr.) were the principal woody species. The sandy bottomland site supported primarily alkali sacaton (Sporobolus airoides (Torr.) Torr.), inland saltgrass (Distichlis stricta (Torr.) Rydb.) and switchgrass (Panicum virgatum L.). Range condition ratings were fair for both sites.

Adjustment to the rations.—

The native range treatment was the normal wintering procedure for beef cattle on the Forrest Ranch. Grazing was confined to the sandy upland site initially with the cattle gradually using the sandy bottomland site toward the end of December (Fig. 1).

<table>
<thead>
<tr>
<th>Feedstuff</th>
<th>Analysis</th>
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<tbody>
<tr>
<td></td>
<td>Dry Matter</td>
</tr>
<tr>
<td>Stubble-wheatfield:</td>
<td></td>
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<tr>
<td>Sorghum stubble1</td>
<td>96.9</td>
</tr>
<tr>
<td>Sorghum heads,</td>
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<tr>
<td>threshed</td>
<td></td>
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<tr>
<td>Wheat forage2</td>
<td>30.9</td>
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<td>Native range:1</td>
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<tr>
<td>Sand sagebrush</td>
<td>94.0</td>
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<tr>
<td>Switchgrass</td>
<td>95.9</td>
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<td>Inland saltgrass</td>
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<td>Alkali sacaton</td>
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<td>Range cubes</td>
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<tr>
<td>All-concentrate:</td>
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<tr>
<td>Alfalfa meal,3</td>
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<td>Cottonseed, whole</td>
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<td>All-concentrate:</td>
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<td>ration, composite</td>
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<td>Silage:</td>
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<td>29.6</td>
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<tr>
<td>Cottonseed meal</td>
<td>91.2</td>
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<tr>
<td>Sorghum grain, medium</td>
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1Sampled December 7-10, 1964.
352,200 micrograms carotene/lb., equivalent to 86,700 I.U. of vitamin A/lb.
4Average of biweekly samples.

No particular problems occurred in this treatment through the feeding period. It was considered the basis of comparison for the other wintering methods.

The 42-acre sorghum field had been harvested in early September. Considerable grain remained on the discarded heads. The irrigated wheat, planted in the fall, had made good growth and averaged 4-inch leaf length at the beginning of the study (Fig. 1). Adjustment to the sorghum stubble and wheat was normal except for two mild cases of wheat poisoning on March 22. All cattle were then moved to an adjacent native range for the last four days of the feeding period.

Although a change in environment — even a simple change from native range to cultivated pasturage — affects cattle performance, such changes must be considered part of a normal ranching operation. The change from native range to confinement in a drylot is, however, more drastic and must be considered in the evaluation of drylot operations. Physiological and sociological problems become more pronounced in confinement and tend to influence cattle performance.

Some difficulty was noted in the adjustment of the silage group. There was an evident loss of weight during the first few days of confinement. Within two weeks, however, the cattle appeared well adjusted to the confinement and ration (Fig. 1). Their original condition was regained rapidly.

Adjustment problems were encountered on the all-concentrate treatment at the beginning of the trial. All cows appeared to
lose weight at first, but initial adjustments seemed satisfactory. By the second week, however, two cows were removed because they were definitely not adjusting to the all-concentrate ration. The remaining cows had no difficulty in adjusting to the all-concentrate ration (Fig. 1).

Some of the difficulty in adjusting to the ration may be attributable to the confinement to small areas. Some range cattle are naturally nervous and will not adjust to any type of confinement. Also, those that are timid are usually the weaker cows and are pushed away from feed by the stronger cattle. They consequently get less and less of the ration, whereas the stronger cows keep getting more. This phenomenon was observed.

It has also been reported that fattening cattle consuming rations with high amounts of sorghum grain will sometimes "go stale" (Cardon, 1965). The exact phenomenon of this is not known, but it may be due to changes in the rumen and the activity of the rumen bacteria. Or, it could be due to the grain itself, its physical condition or digestibility. This phenomenon was not noted during these trials, but the animals were limited to only 7.8 lb./day of sorghum grain.

Observations from this and other studies at Texas Tech suggest that approximately 10% of the cows placed on the all-concentrate ration will not adjust to the ration and/or confinement and should be removed from the ration. Good management and close observation of the cows during the initial two weeks is essential. Those animals not eating or showing evidence of social problems should be removed.

Reproductive performance. — Calving began during the first month but did not reach its peak until near the end of the wintering period. Calving was irregular and incomplete at the end of the wintering period; thus, no inferences can be made as to the effects of the various wintering methods upon calving percentages and weights. However, there was no calving difficulty in any of the groups.

All cows of the native range and stubble-wheatfield groups were pregnant at weaning time (Fig. 2). On the other hand, only 81% of the silage group and 90%
of those on all-concentrate were pregnant. Although not statistically significant (P > 0.05), these differences suggest some reproductive difficulties attributable to drylot treatments.

The lower conception rate of both drylot groups might be attributed to their low level of nutrition at the beginning of the breeding season which began five days after wintering period ended. Cattle from the silage group were in best flesh at the end of wintering period, but were observed to show stress and loss in weight for about two weeks after returning to native range. On the other hand, cattle from the all-concentrate group started the breeding season in low level of nutrition, but were observed to gain weight and improve their general condition rapidly upon being put back on native range. We feel that both the initial low level of nutrition of the all-concentrate group and the period of stress shown by silage group brought about the lower conception rates in these treatments.

Weight changes. — Cows not calving during the wintering period lost significantly (P < 0.05) less weight than those calving. Weight changes of the dry cows will not be discussed since the degree of their fetal development was not known at the end of the wintering period.

Of the cows that calved during the wintering period those in the silage group lost significantly (P < 0.01) less weight than the other groups (Fig. 3). Weight losses by those on native range were similar to losses of the all-concentrate group. Both of these groups lost significantly more than the others. These losses are not considered excessive, however, since winter losses on native range in this region often exceed 200 lb. (Marion et al., 1965). Losses on the stubble-wheatfield were intermediate. Both dry and lactating cows apparently did better on silage than on the other rations.

Gains during the summer period were directly proportional to losses during the preceding winter period for all groups (Fig. 3). Cows with calves born in the all-concentrate groups averaged losing 213 lb. during the 116-day wintering period and gained 226 lb. during the following summer grazing period. In comparison, cows calving on the silage treatment lost only 46 lb. during the wintering period, but gained only 60 lb. during the summer period.

The cattle maintained themselves on the limited ration of 9.5 lb. of all-concentrate until calving. After parturition, however, it was evident that the limited ration was not enough for a cow with her suckling calf. The cows with calves appeared to lose weight steadily to the end of the feeding period even though an additional 2 lb. of cottonseed were added to the ration when calving began. The difference in condition between those cows just calving and those having older calves was evident (Fig. 4). Under ranch conditions, cows should be removed from the limited all-concentrate ration after calving and provided a higher intake of energy.

As a consequence of the weight loss during the wintering period and gain during the summer period, weights at the beginning and end of the study were not statistically different (Fig. 5). All groups weighed slightly more at the end of the summer grazing period than at the beginning of the study a year earlier.

Costs. — Actual costs incurred
Fig. 4. Cows did well until calving but lost weight steadily on 11.5 lb. all-concentrate ration after calving. The cow on the left had a two-day old calf; the one on the right, a two-month old calf.

during the study were used to determine treatment costs to show influences of local conditions. The stubble-wheatfield was contracted at $3.50/A.U.M., averaging $0.12/head/day. The silage feeding was contracted to a local feeder for $9.00/A.U.M. or an average of $0.30/head/day. Both of these treatment costs included management and all feedstuffs except mineral supplement for the stubble-wheatfield group. Use of home-grown and fed silage would undoubtedly lower feed costs for the silage ration. For example, if silage could be grown and fed for $8.00/ton and 40 lb/head/day were required, the 30-day cost would be $4.80. Adding a cost of $0.015 for 0.75 lb/day sorghum grain and $0.03 for 0.75 lb. cottonseed meal, the total feed cost would be $6.15 per month ($0.21/head/day).

Brood cows have been maintained continuously for five years at the Spur Experiment Station, Spur, Texas, on 40 lb. silage, 0.75 lb. cottonseed meal, and 2 lb. sorghum grain for an average feed cost of $6.33/head/month or slightly over $0.21/head/day (Marion et al., 1965).

Feedstuffs in the all-concentrate ration at local prices totalled $0.28/head/day. This includes the addition of 2 lb./head/day whole cottonseed after calving began, but did not include feeding labor cost. Again, a change in price of the feedstuffs, especially the grain, would change the total cost. For example, grain used for this study cost $1.97/cwt. Had the 1964 average price for sorghum grain ($1.73/cwt.) in Texas (Crop and Livestock Reporting Service, U.S.D.A. 1965) been used, the cost for the all-concentrate ration would have been $0.26 rather than $0.28/head/day.

An average cost of $0.16/head/day for native range included a charge of $4.00/A.U.M. grazing fee plus a cost of $0.026/head/day for 1.0 lb./day range cube supplement.

**Summary**

Grade Hereford cows were wintered by four different methods. The methods were native range, sorghum stubble-wheatfield, drylotting on silage, and drylotting on all-concentrates. The cattle were wintered for 116 days in their respective treatments, then turned back on native range. Primary concern was the ability of range cattle to adjust to the all-concentrate ration and to readjust back to native range environment. The reactions of the cattle on the native...
range were considered normal and used as a basis for comparison of the other three treatments.

Some difficulty in adjusting to the drylot was noted in both the silage and the all-concentrate groups. After the first two weeks, however, very few problems were encountered in any of the treatments.

About half of the cows calved during the wintering period. Of the cows that calved, those on the silage group lost significantly less weight than the other groups. Those on the native range and the all-concentrate ration lost similar amounts, and both of these groups lost significantly more weight during the wintering period than the two pasture groups. Weight gains during the summer grazing period were directly proportional to weight losses during the winter period.

Cattle on the all-concentrate ration did well until calving. After parturition, however, the cows lost weight steadily until the end of the feeding period. It was concluded that the cows that calved on limited all-concentrate rations should have been removed and provided with a higher intake of energy.

Only the silage group were observed to lose weight in adjusting back to the native range pasture. This period of stress at the beginning of the breeding period apparently brought about a lower conception rate in this group of cattle.

Costs of the wintering period favored the pasturage methods with the stubble-wheatfield method being the cheapest. Average costs during the winter period were: range — 16¢/head/day, silage — 30¢, and all-concentrate — 28¢/head/day.

LITERATURE CITED


How To Get A Bandwagon Going

JIM WILSON
Wilson Seed Farms, Polk, Nebraska

Highlight

A well-known native-grass seed producer tells how eastern Nebraska farmers and ranchers were inspired to help roll back the frontier of grass-planting knowledge in a unique and highly imaginative “do-it-yourself” grass experiment-and-education program.

“What do I want with your gol-dang bulletins? I ain’t doin’ half as good as I know how, as it is!”

It’s an old joke about a problem as old as agricultural science itself. How can we get the land-user to do as well as he knows how, and learn to do still better?

[Based on a paper presented at the Annual Meeting, American Society of Range Management, New Orleans, Louisiana, February 1 to 4, 1966.]

Hold more meetings and tours? Produce more radio and TV programs? Write more magazine articles and bulletins? Centralize the Information Service? Decentralize the Information Service? Replace the Coordinator with a Director, or vice versa? Overhaul the whole system?

No, the system itself is all right. Almost any system will work, if it’s well spiked with imagination. That’s what we’re short on.

Many college-trained professionals drift into the habit of depending on well-worn academic clichés of thought and expression, instead of thinking creatively. However, you can’t spread the Gospel by rote. Every successful speech, magazine article or information program is a unique, one-of-a-kind symphony of ideas dreamed up by some imaginative fence-jumper who has learned to soar above the dull world of set patterns and procedures and “play it by ear”.

In 1956, after half a lifetime as a travel writer, lecturer, and college teacher, I retired with my wife to one of our farms near the town of Polk, in east central Nebraska, and we began to produce native grass seed (Fig. 1). As landowners in two states, we’d been interested in conservation for many years, and had written several articles on the subject.

This was new territory for native grass. Most of the land-users weren’t ranchers, but farmers, brought up in the tradition of cultivated crops, many of them churning hill land to death in money-losing tillage because they didn’t know what else to do with it.

All they knew about native grass was that you couldn’t afford to plant it, because it “took five years to get a stand.” Not even the Soil Conservation Service nor the College could depend on getting good stands of big bluestem, indiangrass, switch-