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# SUMMER GRAZING PERFORMANCE OF CATTLE AS INFLUENCED BY BY WATER STRESS & TRAILING

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In earlier studies, cattle required to trail 1.6 to 3.2 km between forage and water or allowed access to nearby water every 48 hours reduced the water they consumed by 25-35% (Sneva, et al, 1973). Prolonged treatments for 90 to 130 days did not cause permanent weight loss in mature animals, but reduced gains of suckling calves were not entirely compensated for in recovery periods. This study combined the single components of the previous years' studies and examined the effects of trailing 1.6 to 3.2 km to water every 48 hours on water intake and performance of first-year pregnant heifers.

## Methods and Procedures

Twenty-four heifers due to drop their first calves in the fall were stratified by weight and randomly allotted to six, 64 ha native range pastures. Each pasture was 0.4 x 1.6 km with trailing lanes 1.6 km long built in association with these pastures. Water was supplied ad libitum at a center location in the three control pastures and was placed at the end of the trailing lane of the remaining three pastures. Salt and a 50-50 salt/bonemeal mix was available in each pasture. The trailing lane gate was opened at 11 a.m. every 48 hours and closed 3 to 4 hours later, after the cattle had returned to their pasture. Shrunk weights were obtained on May 17 (trial commencement), July 23, August 20 (trial termination), and August 23 (end of recovery period). During the 3-day recovery period, all cattle had free access to water within the 64 ha pasture. The heifers were weighed also on December 12, after all calves had been born. During January and February, these heifers along with the main herd of brood cows were bred in an artificial insemination program.

Water intake by groups was monitored from June 20 to July 6 and from August 6 to 18. Weather data collected during the intake periods are presented in Table 1.

## Results and Discussion

Water drunk during the early and late periods by the stressed groups averaged 26 and 22% less, respectively, than the control groups. Thus, combining these two treatments did not further reduce intake above that resulting from either treatment alone (as measured in previous years). Mean daily water consumption per head ad libitum was 44.3 and 41.6 liters for the early and late periods, respectively.

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Table 1. Weather statistics of water intake periods

| Variable | June 20 to July 6 | August 6 to 18 |
|---|---|---|
| Mean temperature (°C) | 18.0 | 16.9 |
| Mean wind speed (km/hr) | 6.8 | 6.8 |
| Relative humidity (%)* | 58 | 54 |
| Insolation (langleys/day) | 635 | 563 |
| Precipitation (cm) | 0.5 | 0.0 |

* Computed from 2-hour readings from 5 a.m. to 7 p.m.

Control animals during the 95 day-treatment period gained 77.5 kg per head, 25.1 kg more per head than those under the stress treatment (Table 2). Gains of stressed cattle were significantly lower ($P < 0.01$) than gains of control animals within the first grazing period. Despite the large compensatory gain in the 3-day recovery period total gain of the stressed animals remained significantly ($P < 0.05$) lower (12.7 kg) than that of the control animals. As judged by the within-period weight gain differences, treatment effects influenced gain differences more in the first grazing period when forage quality was high than in the last two periods when forage quality was lower.

Table 2. Weight gain (kg) changes by periods for control & water stressed pregnant heifers

| | 5/17 to 6/19 | 5/17 to 7/23 | 5/17 to 8/20 | 5/17 to 8/23 |
|---|---|---|---|---|
| | Accumulative-period gain per head | | | |
| | - - - - - - - - - - kg - - - - - - - - - - | | | |
| Control | 44.1** | 70.2* | 77.5* | 81.3* |
| Stressed | 19.3 | 42.6 | 52.4 | 68.6 |
| | Within-period gain per head | | | |
| Control | 44.1** | 26.1 | 7.4 | 3.8 |
| Stressed | 19.3 | 23.3 | 9.8 | 16.3 |
| | Within-period gain differences | | | |
| Difference | 24.8 | 2.8 | -2.4 | -12.5 |
| Water diff.[a] | 11.4 | 11.4 | 9.5 | --- |

[a] The difference in water consumption (kg) per head per day of stressed versus control cattle.

* Differences significant at P = 0.05.

** Differences significant at P = 0.01.

Water stress apparently had little or no effect on calving. Mean calf birth weight was 30.9 kg for both treatments. Mean birth date of calves from stressed heifers was October 13, 3 days earlier than that of calves from unstressed heifers.

On December 12, 114 days after treatment termination, weight change per head favored the control animals by approximately 13.6 kg. During the 60-day breeding season three heifers in each group were not detected when in heat. Thus, the water stress generated in this study on animal gain appears to have a long-lasting impact yet does not appear to interfere with the reproductive processes of these heifers.

## Literature Cited

Sneva, Forrest A., L. R. Rittenhouse, and L. Foster. 1973. Stockwater restrictions and trailing effects on animal gains, water drunk and mineral consumption. Proc.: Water-animal symposium Coll. So. Idaho. Twin Falls. June 26-28.