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Using Sprinklers to Improve Performance of Heat-stressed Feedlot Cattle

D.A. Nichols, D.R. Ames, and J.B. Robinson

Summary

During a 56-day test, four pens of finishing cattle were sprinkled when dry-bulb temperatures exceeded 80°F. The performance of the cattle was compared with that of cattle in pens not sprinkled. Cattle in sprinkled pens gained faster (2.83 vs 2.44 lbs per day, $P < .05$) and more efficiently (4.45 vs 5.20 lbs feed per lb gain) than did those in the nonsprinkled. Feed intakes of all cattle were similar.

Introduction

Feedlot performance of cattle is reduced during heat stress because maintenance requirement increases and the animal's appetite is reduced. Sprinklers can be used to reduce heat stress by increasing evaporative heat loss, and reducing ground temperature, thus decreasing radiant heat gain. The benefits from sprinkling increase with air movement and low humidity. Using foggers or fine mist nozzles may increase heat problems, because they increase humidity and reduce rate of evaporation.

Procedure

Fifty-six finishing heifers on a high concentrate diet were maintained (seven to a pen) in eight unshaded concrete pens. When dry-bulb temperature exceeded 80°F, sprinklers came on for 2 minutes, followed by 28 minutes of drying. (The sprinkler control system is shown in Figure 14.1. In each pen, a 45-square-foot area was wetted. Sprinklers used 2.4 gallons of water per hour. The trial began July 1 and ended August 26, 1981. Average daily maximum temperature was 86.7°F and temperatures exceeded 80°F 50 days of the test. Relative humidity (measured at 4:00 p.m. daily) was 42% during the test period. Performance of heifers in sprinkled pens was compared with that of heifers in the nonsprinkled pens.

Results and Discussion

Average daily gain of finishing heifers and their feed to gain ratio were improved ($P < .05$) by sprinkling (Table 14.1), but daily feed intake was not affected. Sprinkled cattle appeared more comfortable and had lower respiratory rates than those not sprinkled.

Our data suggest that sprinklers can be used relatively inexpensively and effectively to reduce heat stress and improve performance of feedlot cattle, especially when air movement is adequate and relative humidity is low.

Table 14.1. Performance of sprinkled versus nonsprinkled feedlot cattle

Treatment	Daily feed (lb)	ADG (lb)	F/G
Sprinkled	12.53	2.83	4.43
Nonsprinkled	12.61	2.44	5.20

ADG = Average daily gain.

F/G = Feed-to-gain ratio.

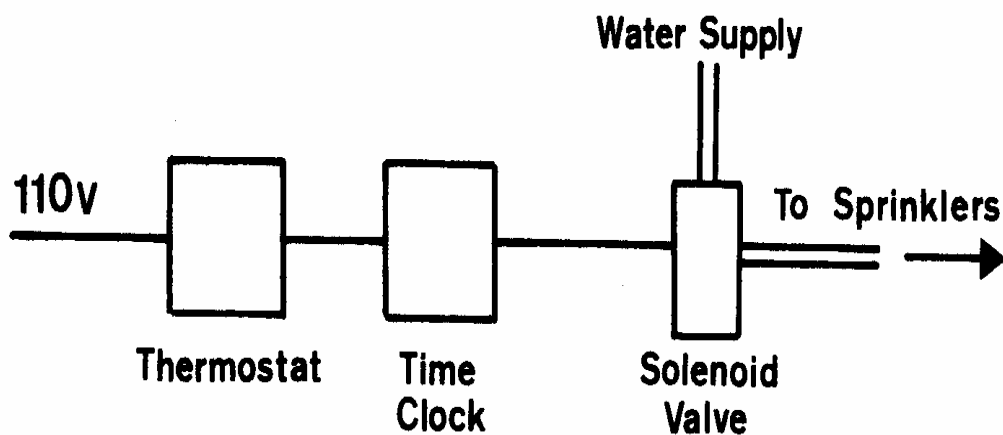


Figure 14.1. Control system for sprinkled pens.