SHRINKAGE OF WHEAT PASTURE STOCKER CATTLE

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Story in Brief

Two trials were conducted to determine 1) shrinkage and rate of refill of stocker cattle removed and subsequently placed back on wheat pasture and 2) the effect of transit time on shrinkage of cattle that had been grazing wheat pasture or had been given access to Bermudagrass hay and water for the previous 24 hours. In trial 1, 24 Hereford x Angus yearling steers (688 lb ± 7.5) were weighed, randomly divided into two groups (Group 1 = controls), and held in drylot pens overnight without access to feed or water. Group 2 was trail driven for 1.6 miles before being placed in drylot pens. Mean 24 hour shrink was not different between the two groups (8.12% ± .31 vs 7.97% ± .43). Both groups essentially refilled to initial weights by 6 hours after being placed back on wheat pasture. In trial 2, the same steers were weighed (714 lb ± 9.0) and group 2 was placed in drylot pens and given access to bermudagrass hay and water for 24 hours. The cattle were then weighed individually, loaded onto livestock trailers and hauled for two, thirty minute periods and three, one-hour periods for a total of 4 hours. Steers of Group 1 tended to shrink more than group 2 over the 4-hour haul (5.16% vs 4.37%), possibly reflecting the slower rate of passage of bermudagrass hay.

(Key Words: Shrinkage, Stocker Cattle, Wheat Pasture.)

Introduction

Stocker operators, cattle feeders and scientists are constantly seeking more information on shrinkage of feeder cattle. Price adjustments to compensate for different shrinkage conditions is common practice in the beef cattle industry (Brownson et al., 1981). Generally, the loss of weight from an overnight shrinkage will vary with the type of feed being consumed by the cattle. Cattle consuming diets high in moisture tend to shrink more when removed from feed than cattle fed diets high in dry matter. The objectives of this study were to (1) determine shrinkage of wheat pasture stocker cattle

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removed from pasture for a 24 hour period, (2) determine rate of refill and (3) determine amount of shrinkage during short-term transit.

Materials and Methods

Trial 1

Twenty-four Hereford X Angus steers (688 lb ± 7.5) that were grazing a wheat pasture (24% dry matter (DM); 24% crude protein (CP) and 66% in vitro dry matter digestibility (IVDMD) on a DM basis) immediately adjacent to a cattle handling/weighing facility were removed from pasture at 2:00 pm (0 hour) on March 26, 1990. The steers were medium-frame number 1 muscle thickness, 11 to 13 months of age and had been on wheat pasture for about 120 days. Immediately after removal from wheat pasture the steers were individually weighed to the nearest pound on scales equipped with a suspension-type load cell and an electronic weighing system. The steers were then randomly allocated to two groups. Group 1 served as the control whereas steers of group 2 were driven by foot up and down an adjacent dirt road for a total of 1.6 miles prior to being returned to the cattle facility. Both groups of steers were then comingled and held in drylot for a 24-hour period without feed and water. During this period of shrinkage, the steers were reweighed individually at 5, 10, 17 and 24 hours to determine cumulative shrinkage. After the 24-hour weight, the steers were placed back on wheat pasture and were reweighed after 6 and 25 hours to determine the extent to which they had refilled or recovered their 0-hour (i.e., preshrunk) weight.

Trial 2

This trial was initiated on April 12, 1990 using the same steers as Trial 1. The steers were removed from wheat pasture at 8:00 am, weighed and Group 2 (714 lb mean weight) was placed in drylot pens and given free-choice access to bermudagrass hay (8.4% CP, and 40% IVDMD on a DM basis) and water for approximately 24 hours. Immediately after the initial weighing, Group 1 (714 lb mean weight) was placed back on wheat pasture (26% DM; 21% CP and 69% IVDMD on a DM basis) for 24 hours. The steers were then gathered again (April 13, 7:30 am), weighed (Group 1: 719 lb. ± 11.7, Group 2: 708 ± 15.4) and placed in one of two bumper-type livestock trailers. The trailer carrying Group 1 was 15.3' X 6' in size with a wood timber floor (1/2" spaces between the lengthwise timbers). Group 2's trailer was 16' X 6' in size; also with a wood timber floor (3/4"-1" spaces

between the crosswise timbers). One steer in Group 1 was removed from the trial because of insufficient space on the trailer. The loaded trailers were then weighed (unattached from the hauling trucks) at the Oklahoma State University Feed Mill scales and hauled for two 30 minute periods (beginning at 8:25 am) and three one hour periods in the vicinity of Stillwater. Upon completion of transit the cattle were unloaded and weighed individually.

Results and Discussion

Trial 1

Mean steer weights, shrink, and standard errors are illustrated in Table 1. Cumulative 24 hour shrink was not different ($P>.68$) for the two groups (Group 1 = 8.12% ± .31 vs Group 2 = 7.97% ± .43). The data indicate a quadratic affect ($P<.0001$), reflecting that the cattle shrank more during the earlier portion of the food and water depravation period. The regression equation for predicting shrinkage (R^2 = .97) was: $Y = 2.00 + .4141(X) - .0068(X)^2$, where: Y = predicted shrinkage, X = hours off feed and water. Weight losses of the steers during the 24-hour shrinkage in drylot were recovered by 6 hours after being returned to wheat pasture as shown by the "refilled weights" at the bottom of Table 1. Weights were similar at both times of 6 and 25 hours after the steers were returned to wheat pasture.

Trial 2

Mean steer weights (by group and individual), shrinkage and standard errors are illustrated in Table 2. Cumulative shrinkage during transit (for each group) was determined by subtracting the cattle + trailer weight, after each hauling period, from the prehaul cattle + trailer weight with adjustments made to trailer weight for accumulation of feces and urine. Waste accumulations were estimated by linearly regressing prehaul empty trailer weight with post-haul, empty trailer weight. Predicted waste accumulations were then added to the prehaul trailer weight and the resulting total subtracted from the observed total weight of each hauling period, to yield group cattle weights. The group cattle weights (after each hauling period) were then compared to the initial group cattle weight to determine cumulative shrinkage. Mean individual cumulative shrinkage over the trial was greater ($P<.06$) for Group 1 (5.09% ± .20 vs 3.85% ± .33) and tended to be greater ($P<.12$) for Group 1 during the transit period (5.16% vs 4.37%). These results may indicate that wheat pasture cattle given access

Table 1. Mean weights, shrinkage and standard errors for steers by group (Trial 1).

	Control (Group 1)				Trailed (Group 2)			
	Wt, lb[a]	SE	Shrink, %[b]	SE	Wt, lb[a]	SE	Shrink, %[b]	SE
Number of steers:	12				12			
Hours off feed								
0	688	±8.4			688	±13.0		
5	662	±8.5	3.87	±.19	660	±13.0	4.04	±.27
10	650	±8.2	5.61	±.21	650	±12.8	5.58	±.33
17	640	±7.9	6.98	±.26	639	±13.2	7.13	±.42
24	633	±8.0	8.12	±.31	633	±12.6	7.97	±.43
Refilled weights								
6[c]	687	±9.2			699	±13.4		
25[c]	694	±8.8			690	±13.0		

[a] Mean weight of group.
[b] Mean of individual cumulative shrinks.
[c] Hours after steers were returned to wheat pasture.

Table 2. Mean individual and group weights, shrinkage and standard errors for steers during transit (Trial 2).

	Control (Group 1)				Hay-fed (Group 2)			
	IWT, lb[a]	SE	GWT, lb[b]	SHRINK, %[c],	IWT, lb[a]	SE	GWT, lb[b]	SHRINK, %[c]
Number of steers:	12		11		12		12	
Hours in transit								
0	719	±11.7	713		708	±15.4	706	
.5			710	.46			702	.55
1.0			700	1.80			698	1.05
2.0			696	2.46			690	2.28
3.0			689	3.37			682	3.32
4.0	682	±10.8	676	5.16	680	±13.6	675	4.37
IShrink[d]	5.09	±.20			3.85	±.33		

[a] Individual mean weight of steers.
[b] Mean group weight of steers (on trailer).
[c] Cumulative shrink.
[d] Mean individual shrink over the trial..

to a medium quality hay for a 24 hour period prior to transit, shrink less than cattle removed from pasture immediately prior to transit. This is possibly due to a slower feedstuff passage rate for cattle given hay. The regression equation for predicting shrinkage (R^2 = .98) of cattle during transit was: Y = -0.0424 + 1.18X, where: Y = predicted shrinkage, X = hours in transit.

Literature Cited

Brownson, Roger. 1981. Shrinkage in Beef Cattle. Oregon State University Extension Service. EC 1066.