CORRELATION OF ULTRASOUND AND MEASURED FAT THICKNESS IN FEEDLOT HEIFERS

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Story in Brief

One hundred twenty three feeder heifers were weighed upon arrival in a commercial feedyard, and again at 60 days and 110 days. At 110 days heifers were scanned with ultrasound for fat thickness. Forty two animals were selected for slaughter at day 110 based on a live weight of 1000 lb and ultrasound subcutaneous fat measurements of .5 inches. The remainder of the animals were fed to 145 days. Subcutaneous fat thickness was measured with ultrasound prior to slaughter and actual fat thickness was measured post slaughter. The r^2 value was .3 for ultrasound vs measured back fat thickness. Accuracy within $\pm$ .10 inches of measured were achieved 36.4% of the time and $\pm$ .20 inches were recorded 65.3% of the time. Carcass parameters indicate that although both groups of heifers were identical in backfat thickness, days on feed was a more reliable indicator of carcass quality, 35.7% choice and 54.4% choice, respectively, than ultrasound fat thickness determination.

(Key Words: Heifers, Ultrasound, Fat Thickness.)

Introduction

The accurate measurement of subcutaneous fat thickness and ribeye area in the live animal would allow more precise estimation of ideal slaughter time. Technology has improved rapidly and ultrasonic equipment advances appear to have evolved where scanning large numbers of animals in a commercial feedlot may be feasible. Implementation of this technique could reduce feeding time and identify both overdone and high performance

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animals. Economic return for superior genetics may be maximized when practical, precise methods of identifying these animals are developed.

Materials and Methods

One hundred twenty three feeder heifers were weighed upon arrival in a commercial feedyard. The animals were fed a 64 mcal/cwt NE_g ration. The heifers were again weighed at 60 days and 110 days on feed. At day 110, heifers were scanned with ultrasound for fat thickness and 42 heifers were selected for slaughter. The average initial weight of these 42 animals was 673 lb. Animals were selected that would produce a minimum of 600 lb of carcass weight with an ultrasound measurement of .5 inches subcutaneous fat at the 12^{th} rib. The remaining animals were fed to 145 days, weighed and scanned with ultrasound for fat cover. The average initial weight of these seventy-nine was 589 lb. Both groups of animals were shipped approximately 60 miles by truck to Booker, Texas for slaughter. Hot carcass weight, 12th rib fat thickness and ribeye area were measured. Kidney, heart and pelvic fat and quality grade was estimated by the same individual. Correlation coefficients were determined for ultrasound fat thickness and actual manually measured fat thickness at the 12th rib.

Results and Discussion

The data on individual animals indicate that ultrasound fat thickness determinations performed under practical industry conditions are not of acceptable precision. Accuracy within $\pm$ .10 inches of measured were achieved 36.4% of the time and $\pm$ .20 inches were recorded 65.3% of the time (Table 1). Subcutaneous fat is not uniformly deposited over the carcass. Consequently, if measurements are not taken in precisely the same location, different values may occur.

The parameters of subcutaneous fat thickness and quality grade are not highly correlated (Table 2). The occurrence of .5 inches of subcutaneous fat does not assure that a particular animal will quality grade choice. Conversely, when the parameters of weight and fat thickness are used to determine the feeding end point, we appear to be sorting off the higher performing, more efficient and profitable animals. The average daily gains of 2.86 lb/day for short fed cattle and 2.45 lb/day for long fed cattle (Table 2) represents a 14% decrease in gain. Also, the most profitable animals in this study were slaughtered first. Pricing in the beef cattle industry currently functions on averages. Consequently, problems are created for the

Table 1. Accuracy and correlation of ultrasound to measured fat thickness.

	Residual fat thickness, in		
Fat thickness	+/-.10	+/-.20	>+/-.20
Number of animals	44	79	42
Percent	36.4	65.3	34.7
r^2, all animals	.36		

Table 2. Carcass characteristics of finished heifers.

Days on feed	110	145
No. of animals	42	79
In weight, lb.	673	589
Final weight, lb.	977	945
ADG, lb/d	2.86	2.45
Hot Carcass Weight, lb.	626	614
KPH, %	2.1	2.1
Fat thickness, in.	.50	.50
Ribeye area, sq in.	11.9	11.9
Marbling Score[a]	392	412
Percent choice	35.7	54.4
Yield grade	2.73	2.76

[a] 400 = Sm^{00}

commercial feedlot when underweight, low performance fat cattle are removed from an "average" pen. Additional time is required to get these animals to a marketable weight. The financial gain realized from the high performance animals may be largely negated by excessively fat, poor performing and lower yield grade cattle.

Literature Cited

Hicks, R.B. et al. 1987. The effect of slaughter date on carcass gain and carcass characteristics of feedlot steers. Okla. Agr. Exp. Sta. Res. Rep. MP-119:351.