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EFFECT OF MEDICAL COSTS ON GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF STEERS OF BEEF CATTLE

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INTRODUCTION

Within the beef industry, the ultimate goal of the feedlot producer is to realize a reasonable return on investment and produce an animal that is desirable in terms of quality and cutability. They also want to produce these animals as efficiently as possible Many factors such as breed type (Knapp et al., 1989), implants (Southgate et al., 1988), and sex class (Jones et al., 1990) have been shown to affect growth and carcass characteristics.

More recently, morbidity has been thought to affect growth performance and cost of gain. For example, as animals become ill, it not only costs the feedlot producer medical costs, but they usually have a decrease in feed consumption that could ultimately affect growth performance. Also, it has been hypothesized that morbidity affects carcass parameters. Therefore, data from the Texas A & M University 1992 and 1993 Ranch-to-Rail Program were evaluated to determine growth performance and carcass attributes in relation to medical costs.

MATERIALS AND METHODS

The Texas Agricultural Extension Service initiated a program in the early 1990s called the Texas A&M University Ranch-to-Rail Program, which was established primarily to provide pertinent feedlot performance and carcass information back to beef producers about their cattle. Producers are allowed to submit a minimum of five steers of various breeds and management backgrounds to a feedyard environment.

Upon arrival at either Randall County Feedyard or King Ranch Feedyard in Texas, the steers were weighed and processed. The processing procedures included a virus vaccine, a vaccination against clostridial organisms, an implant, and a dewormer. The steers were reimplanted after approximately 90 days on feed.

At the time of arrival, the steers were sorted into groups based on weight, frame size, and flesh score. Each pen was fed a diet two times a day, and water was provided on an ad libitum basis. Three separate diets were used for the trial. The first was termed the starter (71.6% DM and 11.0% CP) diet and was fed for the first 14 days. The second was termed the grower (78.2% DM and 10.2% CP) diet and was fed for the next 14 days. The third was termed the finisher (84.8% DM and 11.5% CP) diet and was fed for the remainder of the trial. Steers that became ill were treated according to the guidelines established by the feedyard veterinarians and the costs associated with the treatments were termed medicine costs.

All steers were weighed individually at the conclusion of the feeding period and a 4% shrink was applied to this weight to determine the final weight. This weight compared to the initial weight was used to determine growth performance in the feedyard. Growth performance data included days on feed and average daily gain.

The steers were slaughtered individually at Sam Kane Beef Processors in Corpus Christi, TX, IBP Inc. in Amarillo, TX, or EXCEL Inc. in Plainview, TX when they reached the weight and condition that was considered appropriate by the feedyard manager. Standard linear carcass measurements were determined on the left side of the carcass by trained personnel at 24 h postmortem.

For analyses, steers were placed into one of the following groups based on amount of medical costs: US $0 (n=3,474, G1), US $1 to US $30 (n=978, G2), and greater than US $30 (n=406, G3).

Least squares means and standard errors were generated by the general linear model procedure of SAS (1986). The main effect was medicine costs and Least Significance Differences was used to determine mean separations using a pre-determined p-value of .005.

RESULTS AND DISCUSSION

Cattle that accrued no additional medicine costs (G1) entered and exited the feedyard at a heavier ($P < .005$) weight (Table 1). Cattle that received $1 to $30 (G2) and greater than $30 (G3) in additional medicine costs entered the feedlot at the same weight, however the G3 cattle had lighter ($P < .005$) final weights compared to the other cattle. As medicine costs increased, average daily gain decreased, where the G1 cattle displayed the highest ($P < .005$) and the G3 cattle had the lowest ($P < .005$) average daily gains. Because the G1 cattle

entered the feedlot at a higher weight and had a higher average daily gain, they revealed required fewer ($P < .005$) days on feed. Medicine costs seemed to affect the growth performance because the G1 cattle displayed the heaviest final weights, the highest average daily gains, and the lowest days on feed.

The G1 cattle revealed the heaviest ($P < .005$) hot carcass weights and this could be attributed to the fact that this same category of cattle had the heaviest final weights and the highest ($P < .005$) dressing percentages. The G2 and G3 probed less ($P < .005$) fat at the 12th rib and had less kidney, pelvic, and heart fat compared to the G1 cattle. Cattle that received medicine costs did not perform as well in the feedlot, therefore, this could have contributed to them having less fat, thereby lowering ($P < .005$) their yield and quality grades compared to the G1 cattle. The G1 cattle had the largest ($P < .005$) longissimus muscle areas. Quality grade tended to decrease as additional medicine costs increased where the G1 cattle had the highest quality grades and the G3 cattle had the lowest.

Table 1. Effect of medicine costs on growth and carcass parameters (LSMeans±SE).

Trait	$0 (G1)	$1 - $30 (G2)	> $30 (G3)
Beginning weight, kg	268.4±.7^{b}	257.8±1.2^{c}	258.5+1.9^{c}
Final weight, kg	537.3±.9^{b}	525.8±1.7^{c}	515.1+2.6^{d}
Average daily gain, kg	1.33±.004^{b}	1.30±.007^{c}	1.26±.011^{d}
Days on feed	199.7±.3^{c}	204.6±.6^{b}	201.9±1.0^{bc}
Dressing percentage	63.4±.1^{b}	63.2±.1^{bc}	62.8±.1^{c}
Hot carcass weight, kg	340.3±.6^{b}	332.1±1.1^{c}	323.0±1.7^{d}
12th rib fat, cm	.99±.01^{b}	.89±.02^{c}	.87±.02^{c}
KPH fat, %	2.3±.01^{b}	2.2±.01^{c}	2.2±.02^{c}
Longissimus muscle, cm^2	85.9±.2^{b}	84.4±.3^{c}	83.5±.5^{c}
Yield Grade	2.6±.01^{b}	2.4±.03^{c}	2.4±.04^{c}
USDA Quality Grade[a]	2.4±.01^{b}	2.2+.02^{c}	2.1±.03^{d}

[a]1=Standard, 2=Select, 3=Choice.
^{b,c,d}LSMeans within rows with different superscripts differ ($P < .05$).

CONCLUSIONS

Data reveal that morbidity significantly affected growth performance and carcass traits. In the feedlot, the G1 cattle had the highest average daily gains, exited the feedlots at the heaviest weights, and spent the least amount of days in the feedlot. Healthy animals not only save the feedlot producer money in terms of medicine costs, but they also perform better than unhealthy animals. In addition, healthy cattle tend to be heavier muscled and possess more desirable quality grades than unhealthy animals. In conclusion, it is important to keep animals healthy for desirable growth and carcass attributes. Further analysis is needed to identify those management practices used on the ranch that relate to healthy cattle during the feedyard.

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