P-06-06

Effect of organic selenium supplementation on meat quality of heifers finished in feedlot (#179)

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Introduction

Meat antioxidant status plays a key role in maintaining color and flavor and extending its shelf life, by protecting muscle fiber membranes from lipid peroxidation during storage. The low levels of antioxidants in grains in confinement diets including low Vitamin E concentrations result in decreased lipid stability and reduced meat shelf life (Realini et al., 2004).The objective of this work was to evaluate the effect of organic selenium supplementation on shelf life of meat from heifers fed in a feedlot system.

Methods

Thirty Hereford heifers (n=15 with 20 months of age and 323 ± 26.27 kg live weight, and n=15 with 36 months of age and 405 ± 30.52 kg live weight) were housed in individual pens outdoors and stratified by live weight and age to one of two treatments: 1) Control without supplementation or 2) Supplementation with organic selenium (0.9 mg Sel-Plex 2000/ kg DM/ day, Alltech®). An initial adaptation period of 18 days was followed by an experimental period of 62 days. All animals were fed *ad libitum* with a fully mixed ration (RTM) including 15% moha bait (*Italic Setaria*) and 85% of concentrate. At the beginning and at the end of the feedlot period, blood samples were taken from each animal, for the subsequent determination of glutathione peroxidase activity (Paglia & Valentine, 1967). Loin steaks (2.5 cm thick) were cut from the *Longissimus thoracis et lumborum* muscle (between the 10th rib and 1st lumbar vertebra), packed using styrofoam trays, overwrapped with oxygen permeable film and displayed for 12 days in a refrigerated cabinet (4±1°C). Lipid oxidation was determined by measuring 2-thiobarbituric acid reactive substances (TBARS, Jo & Ahn, 1998). A random plot design with a factorial treatment arrangement was used, considering the animal as the experimental unit. Variance analysis was performed using the MIXED procedure of the SAS system 9.1 (SAS institute, Cary, NC)

Results

Table 1. Blood Levels of enzyme glutathione peroxidase according to treatments and age of heifers

	Treatments			Slaughter Age		
	Control	Selenium	P	18 months	32 months	P
GSH I (U/gr.Hb)	105.8	111.7	0.6426	110.8	106.3	0.7940
GSH F(U/gr.Hb)	195.9	259.7	<.0.0001	242	213.6	0.0598

Selenium supplementation resulted in increased blood glutathione peroxidase activity (p <.0001) which was higher in 20 than 36 months old heifers (p = 0.0598)

Table 2. Effect of Selenium supplementation (Sel-Plex, Alltech®) on TBARS levels (mg malonaldehyde/kg sample) during 12 days of display at 4±1°C.

	Control	Selenium	P
Malonaldehyde (mg/kg)	0.65	0.57	0.048
Days of display			
0	0.52	0.50	0.6724
6	0.66	0.55	0.0456
12	0.75	0.65	0.0452

Selenium supplementation reduced lipid oxidation resulting in lower malonaldehyde levels at 6 and 12 days of display.

Conclusion

Supplementation of feedlot heifers with organic selenium for 9 weeks prior to slaughter reduced lipid oxidation during display resulting in extended meat shelf life

REFERENCES

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Notes