

Effect of Different By-Products on Growth Performance, Carcass Characteristics and Serum Parameters of Growing Simmental Crossbred Cattle

Authors : Fei Wang, Jie Meng, Qingxiang Meng

Abstract : China is rich in straw and by-product resources, whose utilization has always been a hot topic. The objective of this study was to investigate the effect of feeding soybean straw and wine distiller's grain as a replacement for corn stover on performance of beef cattle. Sixty Simmental×local crossbred bulls averaging 12 months old and 335.7 ± 39.1 kg of body weight (BW) were randomly assigned into four groups (15 animals per group) and allocated to a diet with 40% maize stover (MSD), a diet with 40% wrapping package maize silage (PMSD), a diet with 12% soybean straw plus 28% maize stover (SSD) and a diet with 12% wine distiller's grain plus 28% maize stover (WDD). Bulls were fed ad libitum an TMR consisting of 36.0% maize, 12.5% of DDGS, 5.0% of cottonseed meal, 4.0% of soybean meal and 40.0% of by-product as described above. Treatment period lasted for 22 weeks, consisting of 1 week of dietary adaptation. The results showed that dry matter intake (DMI) was significantly higher ($P < 0.01$) for PMSD group than MSD and SSD groups during 0-7 week and 8-14week, and PMSD and WDD groups had higher ($P < 0.05$) DMI values than MSD and SSD groups during the whole period. Average daily gain (ADG) values were 1.56, 1.72, 1.68 and 1.58 kg for MSD, PMSD, SSD and WDD groups respectively, although the differences were not significant ($P > 0.05$). The value of blood sugar concentration was significantly higher ($P < 0.01$) for MSD group than WDD group, and the blood urea nitrogen concentration of SSD group was lower ($P < 0.05$) than MSD and WDD groups. No significant difference ($P > 0.05$) of serum total cholesterol, triglycerides or total protein content was observed among the different groups. Ten bulls with similar body weight were selected at the end of feeding trial and slaughtered for measurement of slaughtering performance, carcass quality and meat chemical composition. SSD group had significantly lower ($P < 0.05$) shear force value and cooking loss than MSD and PMSD groups. The pH values of MSD and SSD groups were lower ($P < 0.05$) than PMSD and WDD groups. WDD group had a higher fat color brightness (L^*) value than PMSD and SSD groups. There were no significant differences in dressing percentage, meat percentage, top grade meat weight, ribeye area, marbling score, meat color and meat chemical compositions among different dietary treatments. Based on these results, the packed maize stover silage showed a potential of improving the average daily gain and feed intake of beef cattle. Soybean straw had a significant effect on improving the tenderness and reducing cooking loss of beef. In general, soybean straw and packed maize stover silage would be beneficial to nitrogen deposition and showed a potential to substitute maize stover in beef cattle diets.

Keywords : beef cattle, by-products, carcass quality, growth performance

Conference Title : ICAS 2015 : International Conference on Animal Sciences

Conference Location : San Francisco, United States

Conference Dates : June 07-08, 2015