Effects of dietary supplementation of pioglitazone or walnut meal on metabolic profiles and oxidative status in dairy cows with high pre-calving BCS

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Short Title

Effect of pioglitazone and walnut meal on oxidative stress in fat cows

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Summary

This research paper addresses the hypothesis that dietary pioglitazone (PGT) or walnut meal (WM) affect plasma metabolites and reduce the oxidative status in fat dairy cows, during the first 21 d postpartum. Thirty six multiparous Holstein cows were randomly assigned to 3 dietary treatments: 1- Control (basal diet; CTR), 2- Walnut meal (9.45% walnut meal of DMI; WM), and 3- Pioglitazone (6 mg/kg BW; PGT). The diets were fed from parturition to 21 d postpartum. Results showed that PGT supplementation increased DMI (22.95 kg/d) compared to the CTR (21.45 kg/d) and WM (21.78 kg/d) groups. The experimental diets had no effect on milk yield and the composition. BCS losses tented to be higher in the CTR group compared to the PGT and WM cows. The PGT group had higher plasma insulin compared to the CTR group (11.84 vs. 10.68 mIU/L), and WM cows had intermediate plasma insulin. The PGT cows had lower plasma NEFA and tended to have lower BHBA than the CTR group. Feeding pioglitazone decreased plasma MDA and increased plasma TAC and SOD compared to the CTR and WM groups. It was concluded that dietary pioglitazone had positive effects on DMI, BCS change, blood metabolites and oxidative status in fresh dairy cows with high pre-calving BCS. The anti-oxidant effects of walnut meal was not supported by the present data. Further studies with higher level and longer time needed to investigate the effect of walnut meal as a natural antioxidant in dairy cows' feeding.