

## **Holstein and Hanwoo Steers Fed Concentrate and Forage Separately Emitted Lower Methane Production than TMR**

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### **ABSTRACT**

Much more research is needed to clarify whether TMR feeding has an advantage over separate feeding of concentrate and forage (SF) in terms of methane production from enteric fermentation. Four Holstein ( $300 \pm 47\text{kg}$ ) and four Hanwoo ( $280 \pm 60\text{kg}$ ) steers were randomly allocated to two groups according to a quadruplicate  $2 \times 2$  Latin square design, respectively. Commercial concentrates were purchased and blended with tall fescue (75:25) in a TMR mixer and fed steers as a TMR or separately to compare enteric methane production, ruminal fermentation characteristics and indirect total tract digestibilities. There were no differences in nutrient intakes and digestibilities between two treatments. The results of  $\text{CH}_4$  measurement indicated that steers fed TMR produce significantly higher ( $P < 0.05$ ) values of  $\text{CH}_4$  produced per day and kg of feed organic matter intake, and energy lost as  $\text{CH}_4$  than those for steers fed SF. However, there were no significant differences in  $\text{CH}_4$  per kg of digestible organic matter and NDF. Numerical higher ( $P = 0.173$ ) acetate to propionate ratio was observed for TMR during 3 hours after morning feeding than SF although acetate remained significantly higher values ( $P = 0.01$ ) than those for SF. Feeding forage and concentrate separately or as TMR may give a different contribution to global warming even though there are little changes in ruminal characteristics and total nutrient digestibilities.

**Keywords:** Total mixed ration, Separate feeding, Methane, Enteric fermentation