Effects Of Bluegrass Straw On Milk Yield, Intakes Of Crude Protein And Phosphorus And Income Over Feed Costs In Early To Mid-Lactation Holstein Cows

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O'Rourke et al. (2007) reported that bluegrass straw (BGS) could be fed at 10% of DMI to Holstein cows in late lactation to reduce dietary phosphorus (P) content and diet cost without affecting milk yield. To examine incorporation of BGS in earlier stages of lactation a similar trial was conducted using Holstein cows in early to mid-lactation. Two subsets of 12 Holstein cows (114 DIM) were selected from within two larger cow groups for data collection and used in a switchback experimental design. These subsets were balanced for DIM and milk yield. All cows within a group were assigned either a control TMR or a TMR containing 10% BGS (dry matter basis), partially replacing alfalfa hay. Cows within each pen were fed their respective diet for 3 wks. The diets were switched and cows were fed the new diet for an additional 3 wks. Feed samples were collected daily and frozen for later chemical analysis. Daily feed intake data (DMI) were collected for the entire pen. Milk samples on all 24 cows were collected on d2, 9, 16, 23, 30, and 37 of the study and analyzed for fat, protein, lactose, solids-not-fat and somatic cell count. Inclusion of 10% BGS in the diet reduced the concentration of crude protein (CP) (21.5% vs. 18.2%) and P (0.39% vs. 0.33%) but increased ADF (24.5% vs. 26.8%) and NDF (32.4% vs. 38.3%). Average DMI was unaffected by BGS addition (26.6 ± 1.47 kg for control vs. 26.2 ± 1.47 kg for BGS). Intake of nitrogen was reduced 162g (925g for control vs. 763g for BGS) and P intake was reduced 17.5g (104g for controls vs. 86.5g for BGS) by inclusion of BGS. Milk yield was reduced by the addition of BGS ($P<0.05$) and averaged 37.74 ± 0.58 kg for controls vs. 35.48 ± 0.58 kg for the BGS treatment. There was no treatment effect on fat corrected milk (FCM) (38.54 ± 0.85 kg and 36.13 ± 0.85 kg for controls and BGS, respectively). Milk components (fat, protein, lactose, and somatic cell count) were unaffected by treatment ($P>0.05$). Milk solids-not-fat was decreased in cows fed BGS (8.8 ± 0.023% vs. 8.72 ± 0.023% for controls and BGS treatments). Income from milk was reduced \$0.94/cow/d by inclusion of BGS ($P <$ 0.05; \$15.56/cow/d for controls vs. \$14.62/cow/d for BGS). However, feed costs did not differ between the controls and BGS (\$8.07 ± 0.35/cow/d vs. \$7.83 ± 0.35/cow/d) and income over feed cost (IOFC) was not affected by treatment (\$1.95 for controls vs. \$1.88 for BGS).

Therefore, 10% substitution of BGS for alfalfa hay in diets of cows from early to mid lactation lowered the % CP and %P in the diet thereby reducing N and P intake. Although DMI and feed costs were not affected by adding BGS to the diet, milk yield, but not FCM yield, was reduced. Income over feed cost was unaffected by addition of BGS to the lactation TMR. In conclusion, although there was a large difference in the price of BGS (\$85/ton) and alfalfa hay (\$270/ton), partial replacement of alfalfa hay with BGS in the TMR did not improve IOFC. However, intakes of both N and P were reduced by addition of BGS.

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