

GRAZING DAIRY HEIFERS ON MEADOW FESCUE OR ORCHARDGRASS

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Background

Rearing dairy heifers for optimal body weight gains (1.8-2.2 lb/day for Holstein breed) is needed to allow for breeding at 13 months of age and reaching an ideal weight by calving. Heifer rearing costs are significant for a dairy farm (\$2.50-3.00/day) with feed costs being about 50% of these costs. Grazing high yielding, high quality pastures has potential to meet these heifer growth goals while possibly reducing feeding costs, but there has been minimal evaluation of heifer growth when grazing different grass species. With the increased interest in meadow fescue for grazing due to its improved quality, this project's objective was to evaluate heifer growth, forage yield, and forage quality when grazing either meadow fescue or orchardgrass.

Methods

Six pastures (2.5 acres each) at the Marshfield Agricultural Research Station (Stratford, Wis.) were established in 2015 to either orchardgrass (variety Haymaster) or meadow fescue (variety Hidden Valley) with 3 pasture replications per species. 24 dairy heifers (5-6 months of age) grazed the pastures (4 heifers per pasture) starting in late-May or early June and ending in mid-October to early November depending on pasture conditions. No grain or forage supplementation was provided during the study. Grazing was repeated for 3 years (2016-2018) using different heifers each year. Managed grazing was used with 10 paddocks (0.25 acres) per pastures and heifers moved to a new paddock twice weekly (every 3-4 days) to allow paddocks a 31 day rest period between grazing events. Heifers were weighed and measured before and after the grazing season. Pasture forage availability was measured pre- and post-grazing using a rising plate meter. Weekly clippings of forage (3-inch residue height) were made to calculate forage availability from the plate meter data and to assess forage quality. Forage quality was estimated using NIRS with calibrations developed from grazing forage samples.

Results

Data are presented in Table 1. Grazing began in mid-May each year with orchardgrass having more rapid early growth, so heifers were placed on orchardgrass pastures one week before meadow fescue pastures. Pre-grazing forage availability was greater for meadow fescue during two of the three years. Overall utilization of forage was similar between the species, but was affected by year. In 2017, excessive precipitation did not allow for management of grass residue to remove reproductive stems and re-initiate vegetative growth. Orchardgrass was more affected by this as the stems are coarser and heifers refused to

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consume the stemmy material. Similar to other work, forage quality was better for meadow fescue with lower neutral detergent fiber (NDF) concentration and greater digestibility of NDF (NDFD). Heifer growth was not significantly different between species across any of the years. In 2017, heifers grazing orchardgrass had numerically lower gains due to reduced forage availability and quality caused by not being able to remove the reproductive stems and less vegetative high-quality forage growth in mid-summer. Meadow fescue did not seem to have the degree of reduced quality and growth, which helped maintain heifer growth.

Conclusions

Overall, meadow fescue had improved growth and quality compared to orchardgrass. Heifer growth was not impacted significantly by species, but the heifers grazing meadow fescue had a more consistent average daily gain each year (1.72 to 1.81 lb/day) compared to orchardgrass (1.50 to 1.70 lb/day). This is likely due to a reduced effect of delayed clipping of mature stems on meadow fescue quality and palatability. In addition, this study shows the importance of pasture management to maintain high-quality vegetative growth, which leads to better animal productivity.

Table 1. Forage availability and quality of meadow fescue or orchardgrass grazed by dairy heifers

	Meadow Fescue				Orchardgrass			
	Mean	2016	2017	2018	Mean	2016	2017	2018
Pre-grazing forage availability, lb DM/acre	1348	1031	1345	1664	1211	1005	1141	1488
Forage utilization, lb DM/acre/year	2671	2874	2432	2709	2703	3393	2432	2362
NDF ¹ , % DM	53.3	51.6	54.8	53.7	56.0	55.2	57.9	54.9
NDFD ² , % of NDF	66.9	69.4	61.3	70.0	64.0	64.7	58.8	68.9
CP ³ , % of DM	14.8	16.4	12.8	15.1	14.1	15.4	12.2	14.7
<u>Heifer growth</u>								
Start weight, lb	529	538	562	494	531	527	575	482
End wt, kg	798	851	836	716	781	818	803	718
Total gain, kg	269	313	274	222	250	291	228	236
Daily gain, kg/d	1.72	1.81	1.79	1.59	1.61	1.70	1.50	1.63

¹ Neutral detergent fiber

² In-vitro neutral detergent fiber digestibility after 48 hour incubation

³ Crude protein