

Estimating Dry Matter Intake of Dairy Heifers

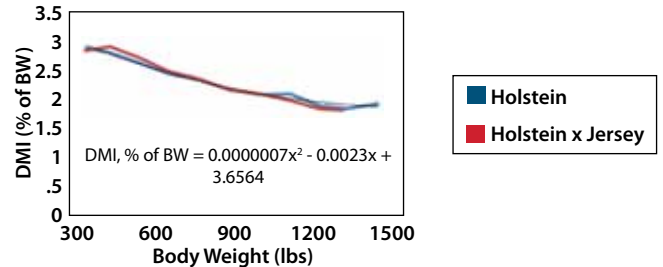
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Predicting dry matter intake (DMI) of dairy heifers is an important part of dairy heifer nutrition programs, but it has been a challenging estimate for myriad reasons. Recently, over 9,000 heifer pen dry matter intakes were collected at the Integrated Dairy Research Facility at the University of Wisconsin yielding new inferences to heifer DMI under near commercial rearing conditions. Summary data is presented in Table 1.

DMI as Percent of Body Weight

Dry matter intake of dairy heifers as a percent of body weight (BW) for Holstein and Holstein x Jersey crossbred heifers is presented in Figure 1. The relationship is not a straight line. Dry matter intake of dairy heifers as a percent of body weight can be estimated using the equation presented in Figure 1.

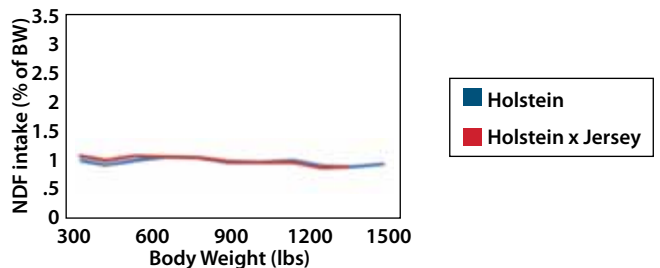
Figure 1. Daily DM intake of dairy heifers based on percent body weight.



NDF Intake

The heifer DMI study at the University of Wisconsin also made a key yet very simple discovery. Dairy heifers consume a near-constant 1.0% of the body weight as NDF (Figure 2). This finding is important because heifers consuming low NDF diets (i.e., corn silage) will eat more feed than heifers consuming high NDF diets (straw, mature forages, etc).

Figure 2. Daily NDF intake of dairy heifers based on percent body weight.



Conclusion

Heifer DMI as a percent of body weight decreases as BW increases for dairy heifers, but the relationship is not a straight line. The DMI of dairy heifers is further influenced by dietary NDF concentration. Low NDF diets increase DMI and high NDF diets decrease DMI within any body weight category.

Table 1. Diet composition and intake characteristics by body weight (BW) of Holstein and crossbred heifers fed to a bunk score 1 (little feed remaining).

Diet Nutrient Density ¹						Intake			
BW (lbs)	CP	NDF		TDN	NE _M	DM (lbs/day)	DM (% of BW)	NDF (lbs/day)	NDF (% of BW)
		x	SD						
Holstein²									
359	16.6	36.1	5.8	69.6	0.82	10.4	2.89	3.6	1.00
443	16.5	33.6	4.4	70.6	0.81	12.5	2.82	4.1	0.92
545	15.9	38.7	7.1	68.5	0.77	14.4	2.65	5.5	1.00
661	14.9	43.1	4.3	66.7	0.73	16.2	2.45	7.0	1.06
769	14.6	44.5	2.2	66.1	0.72	18.1	2.36	8.1	1.05
877	14.6	44.4	2.4	66.1	0.73	19.1	2.18	8.4	0.96
990	14.0	45.7	3.1	65.6	0.72	20.7	2.10	9.5	0.96
1,100	13.5	47.3	2.5	64.9	0.71	23.4	2.12	11.0	1.00
1,210	13.4	47.7	2.2	64.8	0.70	23.2	1.91	11.0	0.91
1,307	13.5	47.8	2.2	64.7	0.70	24.4	1.87	11.7	0.89
1,418	13.1	49.2	1.6	63.9	0.69	27.0	1.95	13.1	0.94
Crossbred³									
355	16.6	36.1	7.6	69.6	0.82	10.14	2.84	3.81	1.07
445	16.5	33.6	6.3	70.6	0.80	12.94	2.91	4.45	1.00
547	15.9	38.7	6.6	68.5	0.76	14.97	2.73	5.84	1.07
659	14.9	43.1	5.1	66.7	0.74	16.53	2.50	7.03	1.06
767	14.6	44.5	2.1	66.1	0.73	18.21	2.37	8.05	1.04
877	14.6	44.4	3.2	66.1	0.72	19.20	2.19	8.60	0.98
988	14.0	45.7	2.6	65.6	0.72	20.88	2.11	9.57	0.97
1,100	13.5	47.3	2.8	64.9	0.70	22.18	2.01	10.56	0.96
1,204	13.4	47.7	2.4	64.8	0.70	22.42	1.86	10.65	0.88
1,292	13.5	47.8	2.2	64.7	0.69	23.61	1.83	11.53	0.89

¹TDN = total digestible nutrients. Nutrient densities expressed on a DM basis with the exception of net energy of maintenance (NE_M) which is expressed as Mcals/lb. ²Database represents 6,174 daily pen DMI. ³Database represents 3,101 daily pen DMI.