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Introduction

Although considerable effort has been directed toward describing nutrient requirements for maintenance and gain in growing-finishing beef cattle, relatively little effort has been made to establish nutrient requirements for these functions in mature beef cows. A high proportion (about 60%) of the feed resources required for beef production can be attributed to maintenance of the cow herd, thus more information is needed on the utilization of nutrients for maintenance and gain and how these parameters are affected by size and type of cow.

Procedures

Twelve mature, nonpregnant, nonlactating cows of each of four types (Hereford x Angus and Angus x Hereford, Jersey x Angus and Jersey x Hereford, Charolais x Angus, and Charolais x Hereford, and Simmental x Angus and Simmental x Hereford) were selected. These breed crosses were chosen to represent medium and large type cows with ability to produce either a moderate or high level of milk. Cows were randomly assigned, within type, to one of three pens (12 pens of 4 cows each) and individually fed either a low (130 kcal ME/W$^{3/4}$ daily), medium (190 kcal/W$^{3/4}$ daily), or a high (ad libitum) level. The diet consisted of corn silage (90%), soybean meal (9.1%), TM salt (0.5%), dicalcium phosphate (0.32%) and vitamin A, D, and E premix (0.08%) and contained 2.53 kcal ME/kg and 12% crude protein. Cows were weighed at the beginning of the study and at 28-day intervals thereafter. Cows were fed a total of 140 days beginning in December.

Results

Weights of cows of different types and fed different levels after 0, 70, and 140 days on feed are presented in Table 1. Jersey cross cows weighed less initially and subsequently than cows of other breed crosses. Angus-Hereford cross cows were heavier than Jersey cross cows but lighter than Charolais or Simmental cross cows. Cows fed the low and medium rations were fed at constant levels, based on weight, thus feed intakes were primarily a reflection of cow weight in these groups. Simmental cows ate more than other types of cows, when fed ad libitum, followed by Angus-Hereford cross and Jersey cross cows. Charolais cross cows ate the least when fed ad libitum. Estimated feed requirements to maintain the weight of Angus-Hereford cross, Jersey cross, Charolais cross, and Simmental cross cows were 8.6, 10.6, 6.3, and 12.8 lb dry feed per day, respecitvely. When expressed as kcal ME/W$^{3/4}$ daily, the values obtained were 112, 157, 85, and 154 for these types of cows, respectively, suggesting breed differences in feed required to maintain cow weight may be of sufficient magnitude to be of importance. Feed required to maintain weight of mature cows was also estimated for each half of the feeding period. These results indicated 191 kcal ME/W$^{3/4}$ daily was required to maintain weight of cows, across all breed crosses, during the interval 0 to 70 days, but only 112 kcal/W$^{3/4}$ daily was required to maintain cow weight during the interval from 70 to 140 days, thus the feed required to maintain cow weight during the winter months was substantially higher (70%) than during the spring months.

Table 1.—Weight and daily dry matter intake of mature, nonpregnant, nonlactating cows

Item	Breed	Diet		
		Low (lb)	Medium (lb)	High (lb)
Initial weight	AHX	1151	1147	1189
	CX	1250	1292	1277
	JX	1001	1003	1028
	SX	1184	1237	1343
Weight, day 70	AHX	1054	1180	1358
	CX	1136	1277	1405
	JX	893	957	1160
	SX	1098	1204	1491
Weight, day 140	AHX	1030	1252	1453
	CX	1105	1343	1427
	JX	864	1023	1226
	SX	1061	1288	1605
Daily feed intake day 0-70	AHX	13	17	30
	CX	11	19	25
	JX	11	15	26
	SX	13	18	29
Daily feed intake day 70-140	AHX	8	14	26
	CX	9	15	21
	JX	7	13	23
	SX	8	15	27

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