

Comparative grazing behaviour of Holstein-Friesian and Jersey dairy cows and their F₁ cross in pasture based production systems

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Introduction Animals suited to grazing systems should attain sufficient quantities of herbage and efficiently convert feed to product (milk solids). Crossing the Holstein-Friesian (HF) with the Jersey (J) breed is considered to result in an animal that is well suited to grazing systems (Harris *et al.*, 1999). The objective of this study was to investigate the grazing attributes of HF, J and Jersey×Holstein-Friesian (F₁) cows under Irish pasture based production systems.

Material and methods Data from 108 animals were available; 37 HF, 34 J and 37 F₁. Mean calving date for these animals was February 18th ±23 d 2007. During the experimental period pasture was the sole feed offered. Milk yield was recorded daily with milk composition and bodyweight (BW) determined weekly. Grass dry matter intake (GDMI) was estimated for each cow on 4 occasions during lactation using the n-alkane technique. Grazing behaviour measurements were recorded twice during lactation using IGER grazing behaviour headset recorders. Measurements were recorded over a 24 h period. Data were analysed using the mixed procedure of SAS. The linear model included the fixed effects of breed group, parity and measurement period. Calving day of year was included as a continuous covariate. Cow was included as a random repeated effect. Orthogonal contrast statements were used to determine differences between the HF and J breeds while the F₁ was compared to the performance of the mid-parent mean.

Results Daily milk yield was greater ($P<0.001$) for the HF (16.9 kg/day) compared to the J (12.8 kg/day). The F₁ (15.7 kg/day) had a higher yield of milk ($P<0.05$) compared to mid-parent mean. Bodyweight was higher for the HF (503 kg) compared to the J (373 kg). Bodyweight of the F₁ was 452 kg indicating an estimate for hybrid vigour of 14 kg. The HF had a higher ($P<0.001$) GDMI than the J (16.7 v 14.6 kg/d). The F₁ had an additional 0.25 kg/d GDMI ($P<0.01$) compared to the parent breed mean. Differences in grazing and ruminating behaviour between the breed groups are presented in Table 1.

Table 1 Effect of dairy cow breed group on grazing and ruminating behaviour.

	Breed group			HF v J		F ₁ v. parent mean	
	HF	J	F ₁	S.E.M.	P-value	S.E.M.	P-value
Grazing time (min/d)	646	637	662	20.1	NS	17.5	NS
Grazing bouts (number/d)	10	8.9	10.2	0.81	NS	0.58	NS
Grazing bout duration (min/bout)	79.5	83.9	71.7	4.99	NS	4.35	<0.05
Total bites (number/d)	40672	39433	39859	1236.7	NS	1078.0	NS
Bite rate (number bites/min)	57	59	60	1.10	NS	0.96	<0.05
Grazing mastications (number/d)	3963	4785	4252	384.0	<0.05	335.1	NS
Grass DMI/bite (g)	0.42	0.38	0.42	0.017	<0.05	0.015	NS
Ruminating time (min/d)	426	371	383	22.1	<0.01	19.2	NS
Ruminating bouts (number/d)	17.4	14.5	12.8	4.92	NS	4.29	NS
Ruminating bout duration (min/bout)	36.8	26.1	32.0	2.16	<0.001	1.88	NS
Ruminating mastications (number/d)	25782	21758	23425	1458.2	<0.01	1271	NS
per 100 kg BW							
Grazing time (min)	129	171	149	64.4	<0.001	45.5	NS
Grazing mastications (number)	796	1292	954	92.9	<0.001	81.1	NS
Ruminating time (min)	83.8	97.5	82.8	3.59	<0.01	4.78	NS
Ruminating mastications (number)	5174	5847	5177	343	0.052	294.2	NS
per kg GDMI							
Grazing time (min)	39.3	44	41.9	1.51	<0.01	1.31	NS
Grazing mastications (number)	241	329	273	25.9	<0.01	22.6	NS
Ruminating time (min)	25.4	24.9	23.6	25.38	NS	1.05	NS
Ruminating mastications (number)	1571	1501	1455	92.6	NS	79.4	NS

Conclusions Ostensibly, little difference in grazing behaviour was apparent between the breed groups. However, when expressed per unit BW and per unit GDMI, differences between the breed groups for grazing measurements were apparent. Evidence presented also suggests that the crossbred may in fact display hybrid vigour for some components of grazing efficiency, thus highlighting the suitability of F₁ cows to intensive grazing systems.

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References

Harris, B.L., Holmes, C.W., Winkelman, A. M. and Xu, Z.Z. 1999. British Society of Animal Science OP No26 (2), 491-493.