

### Summary

The effects two stocking densities of Holstein Friesian cows and Jersey Crossbred (Jersey x Holstein Friesian) cows on poaching damage were compared.

Although the higher stocking density increased poaching damage, there was no difference between the two breeds.

This was attributed to similar static loading pressures of both breeds: the smaller cows had smaller hooves and, hence, caused similar damage to the soil surface.

### Background

Rotational grazing systems involve a high stocking-density of cows in small areas for short periods with high risk of sward and soil damage (poaching) during high rainfall. Poaching damage lowers herbage production and utilization.

The objective was to determine the effect of grazing by Holstein Friesian (mean 570 kg liveweight) and Jersey Crossbred (mean 499 kg liveweight) cows on soil physical properties and poaching damage.



Holstein Friesian cow



Jersey Crossbred cow

There were two stocking densities of each breed (Table 1). The cows were turned out to graze after calving in spring and generally remained outside until November. Exceptions were when herbage availability was too low or when soils were too wet. Soil bulk density, total porosity, macroporosity, gravimetric moisture content, volumetric moisture content, air-filled porosity, penetration resistance and shear strength) were measured on four occasions per year using standard methods.

**Table 1.** Cow live-weight and imposed stocking- densities

	Mean live-weight* (kg/cow)	Stocking-Density (Cow/Ha)	
		2011	2012
HF-L	573	2.35	2.45
HF-H	567	2.56	2.67
JX-L	501	2.39	2.49
JX-H	497	2.64	2.75

\*P<0.001, Standard error of mean (S.E.M.) = 5.6kg

Throughout the grazing season hoof depth and surface deformation were measured. The size of the back left hoof of a subset of cows from each herd was measured and taken to represent the four hooves of each cow.

### Results

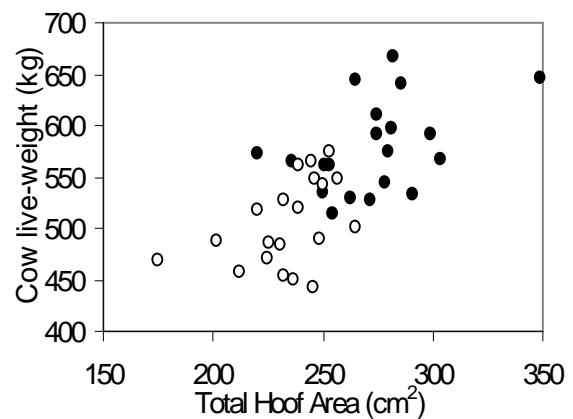
Cow liveweight and stocking density had no effect on bulk density or air-filled porosity over the course of the experiment. The higher stocking density increased soil surface deformation and hoof depth. There was no difference in soil surface deformation and hoof depth between the breeds. The lack of a difference in poaching damage between the breeds was attributed to similar static loading pressures of both breeds: the smaller cows had smaller hooves and, hence, caused similar damage to the soil surface (Figure 1).

Poaching damage was much greater in 2012 than 2011 due to the much higher rainfall during the grazing season (784 mm compared with 588mm during the period from 1 March to 31 October). The mean number of grazing days was 232 in 2011 and 198 in 2012.

While the Holstein Friesian cows had higher milk yields, the Jersey Crossbred had higher

fat and protein percentage with the overall result that there was no difference in yield of fat and protein per cow or in the value of milk sold per cow.

The six week and nine week pregnancy rates were 33% and 69% for the Holstein-Friesian, and 53% and 81% for the crossbred cows. The crossbred cows exhibited superior reproductive performance than the Holstein Friesian cows.



**Fig. 1.** Cow live-weight(Y) and total hoof-area (X) for HF (●) and JX (o) cows. HF cows are heavier (P<0.001) and have larger hoofs (P<0.001) than their JX equivalents.

The effect of dairy cow breed and stocking density on milk production

System	HF L	HF H	JX L	JX H
Milk (kg/cow)	5838	5820	5487	5466
Fat (%)	4.90	4.41	5.10	5.14
Protein (%)	3.64	3.49	3.82	3.83
Fat (kg/cow)	286	255	279	280
Protein (kg/cow)	213	202	210	209



### Recommendation

Although the Jersey Crossbred cow offered no advantage in terms of poaching damage, superior reproductive performance coupled with similar milk production means that the Jersey Crossbred cow is better suited to compact-spring calving pasture-based systems of milk production

