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THE RELATIONSHIP BETWEEN PREFERENCE AND SHORT-TERM FEED INTAKE RATE FOR LEGUME AND CEREAL HAYS

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Hay exporters are seeking an objective test to indicate animal preference, as this is particularly important to Japanese hay buyers. This is in addition to energy, protein and fibre content, which are the common measures of nutritive value. Currently the factors that influence preference are poorly defined and have not been compared across animal species. Feed intake rate, which is measured in short-term feeding studies may be a useful indicator of preference. The aim of this experiment was to undertake short-term feed intake rate tests using a range of cereal and legume hays offered to sheep, horses, beef and dairy cattle. The results were then compared to preference rankings obtained in a separate but associated study (Knott *et al*. 2002).

Nine legume hays (including Persian clover, medic, balansa clover, lucerne and vetch) and nine cereal hays (including oaten and barley hay, and barley straw) were offered to sheep, horses, dairy cattle and beef cattle (n=18, 12, 9 and 12, respectively) in a series of 5-minute feed intake tests. All hays were processed to a length of 10-15cm before feeding. Animals were housed in individual pens with access to a single feed bin. All animals were exposed to each of the hays at least twice prior to the feed intake tests in order to remove the novelty aspect of the feeds and were trained to eat in a short period of time. On the day of testing the sheep, horses and beef cattle were given a small quantity of pasture hay to break their fast, while the dairy cows received 3 kg of grain in the dairy at milking. Tests were limited to 6 per day for dairy cows and 2 per day for beef cattle, horses and sheep.

Preliminary statistical analysis shows that the intake rate of the hays differed within each of the animal species (Table 1). When compared with the preference tests (Table 2) there were strong correlations between the predicted means for preference and feed intake rate across the livestock species.

Table 1. Legume and cereal hay ranks based on intake rate tests undertaken across four livestock species

	Cereal Hays				Legume Hays			
Rank	Beef	Sheep	Horses	Dairy	Beef	Sheep	Horses	Dairy
1	OAT7	OAT3	OAT7	OAT3	PER	LUC5	LUC3	BAL
2	OAT3	OAT5	OAT3	OAT1	MED	LUC3	LUC5	LUC5
3	OAT2	OAT6	OAT1	OAT7	BAL	LUC1	LUC6$^+$	PER
4	OAT1	OAT7	OAT2	OAT5	LUC5	MED	PER	LUC4
5	OAT6	OAT1	OAT4	OAT2	LUC1	PER	MED	MED
6	OAT5	OAT2	OAT5	OAT6	LUC6$^+$	BAL	LUC1	LUC1
7	OAT4	BAR	OAT6	BAR	LUC7$^+$	LUC4	LUC7$^+$	LUC3
8	BAR	OAT4	BAR	OAT4	LUC4	LUC2*	LUC4	VET*
9	STR	STR	STR	STR	LUC3	VET*	BAL	LUC2*

OAT = oaten hay, BAR = barley hay, STR = straw, PER = Persian hay, LUC = lucerne hay, MED = medic hay, BAL= balansa clover hay, VET = vetch hay. * These hays were removed from subsequent preference tests and $^+$ these hays were substitutes.

Table 2. Legume and cereal hay correlations between preference and feed intake results

	Beef	Horses	Sheep	Dairy
Cereals	0.894	0.878	0.952	0.917
Legumes	0.878	0.893	0.950	0.857

From the preliminary analysis, it appears that feed intake rate is associated with preference. Further work is required to test the strength of the correlations across a wider range of hay types and to identify chemical or physical factors in the hay which affect intake rate and preference.

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