

The relationship between feed efficiency, methane and behaviour in beef cattle

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Scotland's Rural College (SRUC) has recently finished investigating the effects of selection for improved feed efficiency on animal health and welfare.

Feed efficiency trials were carried out over two years with the use of Luining and Charolais crossbred steers, which were fed two differing diets; a mixed diet (50% forage: 50% concentrate) and a concentrate diet (8% forage: 92% concentrate).

Behavioural measures were recorded in terms of the animals':

- Response to being confined in a crush
- Speed of exit from the crush
- Activity levels
- Dominance behaviour at feeding
- Feeding behaviour including intake and feeding time

Results

Performance of Charolais crossbred and Luining steers on different diets

	Charolais crossbred		Luining	
	Concentrate diet (8:92)	Mixed diet (50:50)	Concentrate diet(8:92)	Mixed diet (50:50)
Average daily gain (kg/day)	1.7	1.6	1.6	1.5
Dry matter intake (DMI kg/day)	11.7	10.6	11.2	10.7
Residual feed intake (RFI)*	0.2	-0.8	0.4	0.1
Methane emissions (CH ₄ g/day)	143.7	192.1	149.7	184.3
Methane emissions per kg dry matter intake (CH ₄ g/kgDM)	13.2	20.1	14.6	20.5

Behaviour influenced feed efficiency in a number of ways, with steers that showed higher levels of aggression being more efficient on the mixed diet and steers with an excitable temperament displaying poorer feed efficiency.

The results also showed that steers with a large variation in feeding pattern had poorer efficiency. This may be explained by dominance within the social group and those animals having a lower rank in the group hierarchy only feeding as and when they can. One way to prevent this is to provide sufficient access for all animals to feed at the same time.

These results show that selecting animals with a relatively calmer temperament, that are not too excitable or submissive, may be an effective way of improving feed efficiency.