

## The effects of auditory enrichment on the behaviour of dairy cows

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**Application** Classical music, country music and audiobooks increased the locomotive and positive social behaviour in Holstein Friesian Cattle, and reduced resting and abnormal behaviours. Auditory stimulation may have application as environmental enrichment in the management of dairy cows.

**Introduction** Concerns have been raised about the welfare of cows when housed in intensive systems. This is due to issues such as lameness, spatial restriction, increased aggression and abnormal behaviours (Broom, 2010). Auditory environmental enrichment has been suggested to have positive behavioural effects in a range of species, however the use of auditory stimulation in dairy cows has been largely unexplored. This study aimed to investigate the effects of classical music, country music and audiobooks upon the behaviour of dairy cows.

**Material and methods** 70 early lactation Holstein Friesian dairy cattle were utilised in the study. The cows were mixed parturition and were aged between two and thirteen years. The herd is an all year round calving herd and has an average annual yield of 8900 litres. The cows were housed in freestall barns with *ad lib* access to food, freestall units and a walkway. Cattle were exposed to four auditory conditions; a no auditory control, classical music (The Classical Chillout Gold Collection), country music (John Denver- Legends) and audiobook (Harry Potter and the Philosophers Stone, narrated by Stephen Fry). The cows were exposed to each condition for 4 hours a day for 3 days with an intervening period of 4 days between conditions. Instantaneous scan-sampling was used to record the cows' behaviour every 10 min throughout the 4 hr auditory conditions.

**Results** The cows showed less tongue rolling behaviour ( $P<0.001$ ) and vocalisations ( $P<0.001$ ) and more locomotive behaviours ( $P<0.001$ ) when exposed to all auditory conditions, compared to the no music control. Furthermore, the cows displayed more positive social interactions during exposure to classical music and the audiobook compared to the control and country music conditions ( $P<0.001$ ). Cows also displayed more resting ( $P<0.001$ ) and ruminating behaviours ( $P<0.001$ ) during the control condition compared to all other conditions.

Table 1: The mean ( $\pm$ S.D.) number of times each behaviour was displayed by the cows in the four auditory conditions

Behaviour	Control	Classical	Country	Audiobook	Behaviour	Control	Classical	Country	Audiobook
Lying/resting	37.29 (9.192)	30.63 (4.547)	32.03 (11.052)	27.11 (6.100)	Stepping in place	3.20 (2.269)	5.20 (2.269)	4.81 (4.648)	8.66 (3.185)
Ruminating	18.97 (8.218)	9.56 (3.313)	13.77 (9.224)	7.26 (3.829)	Locomotion	1.51 (1.380)	14.13 (4.156)	3.81 (3.376)	15.19 (5.588)
Standing still	23.96 (7.033)	20.21 (4.400)	24.71 (9.767)	18.13 (6.171)	Vocalising	2.89 (1.664)	1.37 (1.230)	0.89 (1.336)	1.31 (1.389)
Body care	2.71 (3.084)	2.19 (1.609)	4.24 (5.160)	3.19 (2.202)	Environmental sniffing/licking	0.54 (0.912)	3.20 (1.908)	3.01 (3.100)	4.57 (3.395)
Drinking	3.63 (2.273)	3.64 (1.786)	3.27 (5.524)	3.16 (2.412)	Social interaction	0.63 (0.663)	3.09 (1.412)	1.20 (1.807)	3.74 (2.913)
Eating	5.10 (2.803)	4.46 (2.406)	12.09 (9.543)	8.66 (4.693)	Agonistic behaviour	1.41 (1.388)	1.04 (0.955)	1.14 (1.739)	1.10 (1.495)
Urination/defecation	2.83 (1.777)	3.06 (1.550)	1.79 (2.346)	2.61 (1.600)	Tongue rolling	2.01 (1.460)	0.71 (0.870)	0.04 (0.266)	0.57 (1.015)

**Conclusion** Provision of auditory stimulation to dairy cows achieved a number of the goals of environmental enrichment. Use of auditory stimuli reduced abnormal behaviours such as tongue rolling which could suggest reduced stress and increased welfare. Auditory stimuli also enhanced behavioural diversity such that increased locomotive and positive social interactions were seen in dairy cows. However periods of no auditory stimulation also seem to be beneficial in dairy cows. Increased resting and rumination were displayed in the

absence of auditory stimulation. This could indicate enhanced relaxation in the cows and also increase productivity. Use of music and audiobooks has the potential to be utilised as environmental enrichment for dairy cows, however incorporating periods of no auditory stimulation should also be considered as part of the management routine.

### **References**

Broom D, 2010. *Journal of Veterinary Medical Education*. 37(1), 83-88