

Milk cortisol response to group relocation in lactating cows

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Short title: **Milk cortisol in dairy cows' relocation**

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Summary

The aim of the study was to analyse the variations in milk cortisol concentrations in response to the relocation of dairy cows between production groups. A preliminary study was carried out on 13 Holstein Friesian (HF) and 7 Norwegian Red (NR) cows and was aimed at measuring the concentration of milk cortisol during 3 consecutive days in the morning and afternoon milk without environmental perturbation. The mean values of cortisol concentration in cows without apparent environmental perturbation did not vary significantly between days (D1, D2, D3) and time of sampling (morning milking, AM and afternoon milking, PM) and no differences were observed between HF and NR breeds. A second study was carried out on 50 HF and 26 NR cows to measure milk cortisol in the afternoon milk 2 days before and 3 days after relocation. Milk cortisol concentrations did not vary during the two days before the relocation (day 1 and day 2), while a significant increase was observed on the day of relocation (day 3). On the days 4 and 5 cortisol concentration in milk remained constantly high. No differences were observed between breeds, confirming the results obtained in the preliminary study.

The increase of milk cortisol in response to animal relocation in new production groups, a managerial procedure largely adopted in commercial dairy farms, indicates that this hormone can be considered as a suitable biomarker to assess the HPA response of dairy cows to a short/medium-term environmental challenge.