

# Lying Behaviour of Dairy Cows in Cubicles

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## Improving dairy welfare by improving management

In dairy barns, cows are restricted in their lying behaviour in several ways. A better designed lying area will ensure a better welfare and higher production levels for dairy cows [1, 4-10]. Besides the design of the cubicles, on-farm climate and other farm and herd characteristics such as stocking density and number of cubicles available per cow, determine much of the lying behaviour of cows [2].

Live observations of lying cows are difficult to obtain, because many cows are unused to unfamiliar observers and will react behaviourally (i.e. change their posture) to the presence of these observers. It is, therefore, difficult to observe lying behaviour and investigate relations between lying behaviour and other factors in a reliable manner.

In this study, we have recorded lying behaviour by using video recordings. On 14 farms, 24-hour recordings were made of lying behaviour of dairy cows by using 2 webcams per farm. No researchers were present during the filmed period, so that behaviour of the cows was undisturbed. Lying behaviour was analyzed using the Observer 10.5 (Noldus Information Technology bv). A simple ethogram was used including the behavioural elements standing, lying down, lying and standing up. Video files were coded using continuous sampling resulting in mean and frequencies of lying bouts, time used for lying down and for standing up, and time spent standing in the cubicle ('standing idle'). Standing and lying times are important indicators for cow welfare [3].

Temperature was recorded during 24 hours by using data loggers. Additional to these data, cubicle design, including bedding material, was recorded, other farm and herd characteristics were recorded using a cow comfort score protocol [11] and some climate measurements including air speed and humidity have been done, just before the cameras were installed.

On another 12 farms, no video recordings were made but a digital camera was used to take pictures of the posture of lying cows in cubicles, to see whether lying posture, recorded from the pictures, was related to farm and herd characteristics. We expected that taking pictures was a fast enough method not to influence cows too much. On these farms, cubicle design and other farm and herd characteristics were also recorded.

The relations of lying times, standing time and time used for standing up and lying down, with cubicle design parameters, were calculated using linear regression. The relations of lying posture with farm and herd characteristics was calculated using binary logistic regression. A comparison was made with available data of lying behaviour of cows kept outdoors in pasture. Furthermore, relations between lying behaviour and climate measurements were calculated using a repeated measures analysis.

These results can be used to further optimize cubicle design and management of dairy cows.

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