

## **Positive relationships between the use of mechanical rotating brushes, social behaviour and production parameters and in loose-housed dairy cows**

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This study investigated the relationship between the use of mechanical rotating brushes, social behaviour and production parameters in a mixed group of Holstein (32%) and Swedish Red (68%), second and third lactation dairy cattle. The average group size was 55 cows and information was gathered on a total of 72 cows over a 9-week period. The loose housing cubicle system was equipped with an individual automatic milking system and two mechanical rotating brushes in the alley opposite the roughage bins. Milk yield, feed consumption and performance parameters were monitored individually and merged with data from behaviour observations of brush use by individual cows. From observations of social behaviour (giver and receiver) we determined the dominance rank (based on butting, threats, pushing and fighting) and the affiliative rank (based on social licking and sniffing) for each individual. Both dominance and affiliation rank affected brush visits. Middle dominance ranked cows and high receivers of affiliative social behaviour visited the brush most often. There was a positive relationship between the frequency of brush use, milk yield and intake of roughage. A closer look at the estimates showed that each additional brush use was associated with a higher milk yield of 0.75kg and a higher roughage intake of 0.32 kg dry matter per day. The statistical analysis with mixed models using brush use as a covariate allows us to say that these relationships were independent of the breed, lactation number, stage of lactation, dominance or affiliative rank of the cows. Unfortunately, it is not possible from this study to identify the 'driver' in this triad, although it would be interesting to test the hypothesis that the tactile stimulation for the cow while using the brush is a trigger for the oxytocin release chain. This might explain the increase in milk yield and consequently feed consumption. The relationship between received positive social interactions, which includes licking, and the frequency of brush use implies that tactile stimulation is more important for some cows than for others.

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