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CENTRE OF EXCELLENCE  
IN  
ANIMAL WELFARE SCIENCE

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

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## Aim

Investigate relationships at the individual cow level between

- brush use and production related measures
- brush use and social behaviour (dominance and affiliative)



## Why?

Grooming important for long term survival.

Likely associated with positive affective states (....comparison with play which is mainly shown in young animals).

May be a potential welfare indicator with potential to be automatically recorded:

1. 'Luxury' behaviour may be sensitive to reduced welfare
2. 'Buffer' following stress



# Dairy barn

Loose housing system  
Automatic milking system  
Two swinging cow brushes



Group size  $55.46 \pm 0.25$  (mean  $\pm$  se)  
Holstein (32%) and Swedish Red (68%),  
2<sup>nd</sup> and 3<sup>rd</sup> lactation cows

Study carried out (alternating weeks) during 9 weeks.

# Production measures

From same periods as behavioural observations

## Milk

Quantity of milk (kg per day),  
Somatic cell count (per 1000),  
Milk fat and protein (%),  
Milk flow (max and mean rate per min).

## Feeding

Roughage eaten

## Health

Welfare Quality assessment  
Farm's own health records



# Behavioural observations

Direct and video recordings of individually identified cows

## **Brush use**

Frequency and duration of brushing

## **Social behaviour**

Aggressive interactions (threats, head butting, pushing, fighting)

Affiliative interactions (licking and sniffing)



Early (7-100 days),  
Middle (101-200 days)  
Late (>200 days)

## Analysis

Cow classified according to **stage of lactation**

**Dominance index** High, middle and low

$$\frac{\text{Freq. giving aggression}}{\text{Freq. give and receive aggression}}$$

**Affiliative index** High givers, middle, low.

Low affiliative ranked cows receive alot of affiliative behaviour.

$$\frac{\text{Freq. giving affilliative behaviour}}{\text{Freq. give and receive affiliative behaviour}}$$

# Relationship brush use and behaviour

Effect of dominance rank on brush use ( $P < 0.005$ )

Middle ranked cows used brush most, subordinate least.

Effect of affiliative rank ( $P < 0.05$ )

High receivers visiting brush most often,

High receivers had longest brushing bouts



# Relationship brush use and production

## **Brush use and milk yield ( $P < 0.01$ )**

Each additional time the cow used the brush is associated with 0.75kg higher milk yield per day.

## **Brush use and intake of roughage ( $P < 0.001$ )**

Each additional time cow used brush was associated with 0.32 kg more dry matter consumed per day.

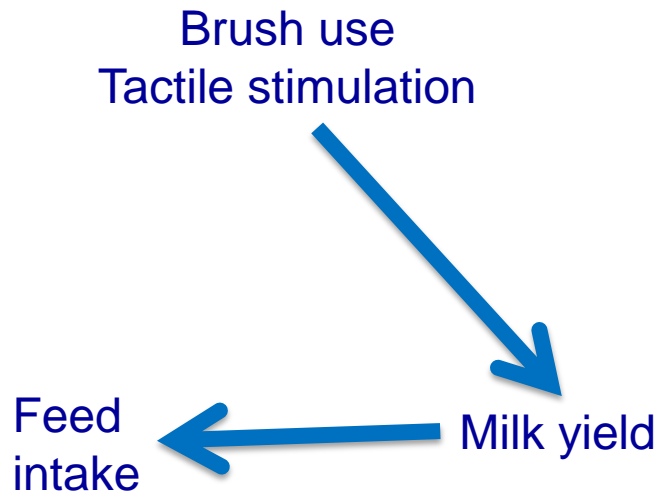
These effects are independent of breed, lactation number, stage of lactation, dominance or affiliative rank of the cows as included in model

## Mechanism?

- Cows receiving more affiliative behaviour used the brushes more often and for longer.

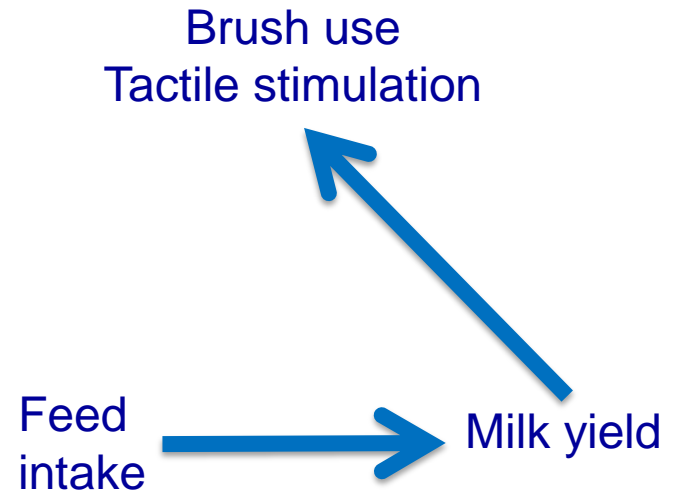
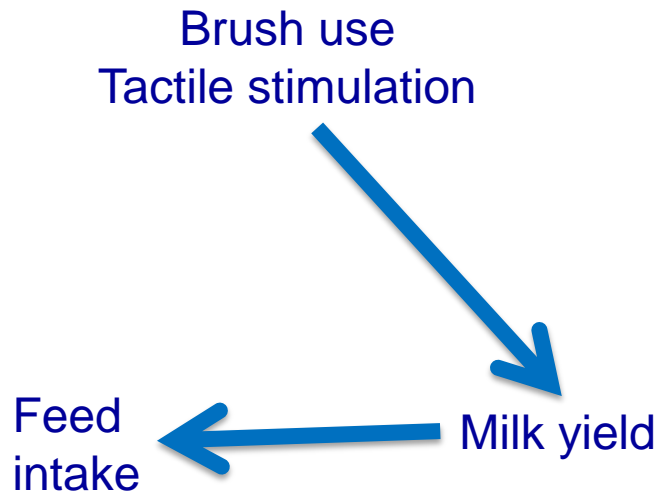
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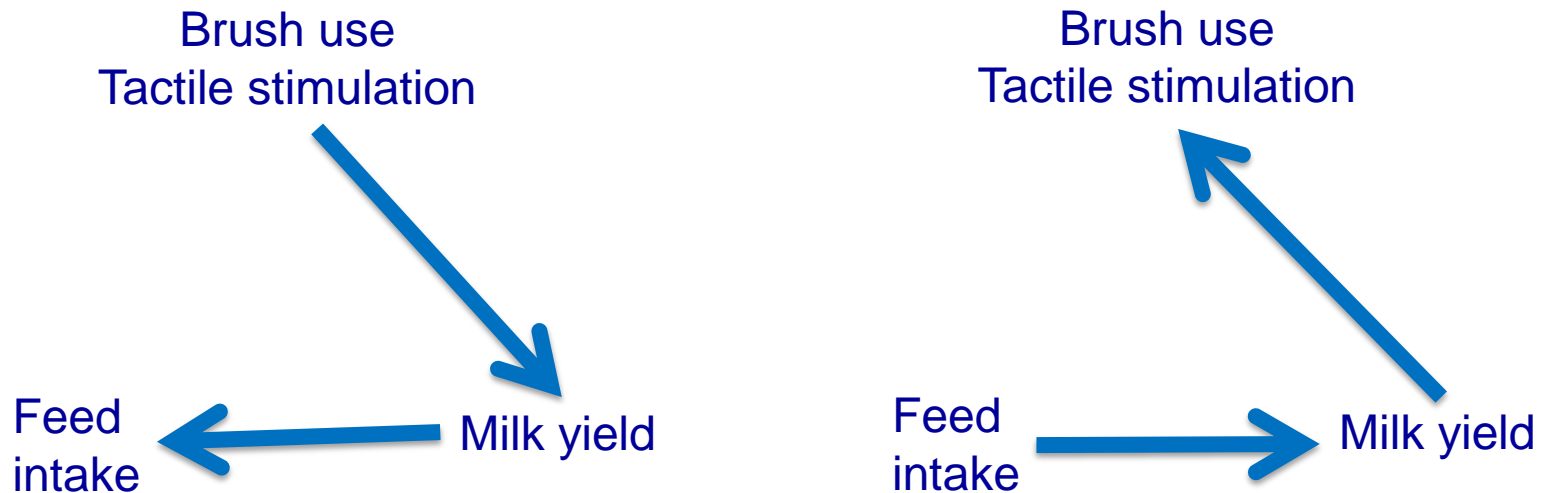
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- Or do these cows just have more 'free time' in their time budget?