*Table S1: Questionnaire on farm management and husbandry conditions.*

| N | Question | Answers | Included in model |
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| **General Information** | | | |
| 1 | Farm run as full-time or spare-time job? | • Full-time<br>• Spare-time | No, all farmers working full-time |
| 2 | Conventional or organic farm? | • Conventional<br>• Organic | Yes |
| **Feeding** | | | |
| 3 | Time for rumen adjustment when changing silage? | • < 5 days<br>• > 5 days | Yes |
| 4 | Proportion of concentrate? | • > 45%<br>• 35 – 45%<br>• < 35% | Yes |
| 5 | Proportion of structured feed? | • No calculation<br>• ___ % | Yes |
| 6 | Is the length of structured feed particles above 3cm? | • Yes<br>• No | No, all farmers answered Yes |
| 7 | Are feed analyses done? | • Yes, mostly<br>• Yes, sometimes<br>• No | Yes |
| 8 | Are feed rations calculated throughout the year? | • Yes<br>• No | Yes |
| 9 | Addition of minerals and vitamins to the ration? | • No<br>• Yes, for cows in milk<br>• Yes, for dry cows<br>• Yes, for youngstock | Yes |
| 10 | How is the concentrate fed? | • Individually<br>• Per group<br>• Mixed form | No, as all farms feed an upgraded mixed ration at the feeding trough and individually assign the remaining concentrate over the AMS |
| 11 | Which animal groups share the same feed ration? | • Early-lactating cows<br>• Late-lactating cows<br>• Dry cows<br>• Youngstock < 1 year<br>• Youngstock > 1 year | No, only cows in milk were used in the final model and early-lactating and late-lactating animals receive the same feed ration on all farms. |
| 12 | Was the feeding management changed within the last few years? | • Yes<br>• No | No, no changes during study period |
| **Husbandry** | | | |
| 13 | Is there alpine pasture? | • No<br>• Yes, for cows in milk<br>• Yes, for dry cows<br>• Yes, for youngstock | Yes |

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| 14 | Are cooling systems (ventilator, air tubes) available? | • No<br>• Yes, for cows in milk<br>• Yes, for dry cows<br>• Yes, for youngstock | Yes |
| 15 | Are cow showers available? | • No<br>• Yes, for cows in milk<br>• Yes, for dry cows<br>• Yes, for youngstock | Yes |
| 16 | Are animals kept on pasture? | • No<br>• Yes, for cows in milk<br>• Yes, for dry cows<br>• Yes, for youngstock | Yes |
| 17 | If animals are kept on pasture, what type of procedure? | • Whole day<br>• At night<br>• Two times a day<br>• other | Yes |
| 18 | For how many days are animals kept on pasture? | • ___ | Yes |
| 19 | How many hectares of pasture are available? | • ___ | Yes |
| 20 | Do cows have access to outdoor areas? | • Yes, paved outdoor area<br>• Yes, but not paved<br>• No | Yes |
| 21 | Do they have permanent access? | • Yes<br>• No | No, as all farms with outdoor areas give permanent access |
| 22 | How are animals kept in tie-stalls? | • No tie-stall<br>• Other methods | No, all cows kept in free stall barns |
| 23 | How are animals added to the herd? | • Abruptly<br>• Visual contact beforehand<br>• differing | Yes |
| 24 | Are there calving pens? | • Yes<br>• No | No, all farms have calving pens |
| 25 | How many cows are kept in the calving pen? | • One cow<br>• More cows | Yes |
| 26 | How often is the calving pen cleaned? | • After each calving<br>• Less often | No, no calving pen is cleaned after each calving |
| 27 | For how long are cows kept in the calving pen after giving birth? | • ___ days | Yes |
| 28 | For how many days before calving are heifers added to the herd? | • ___ days<br>• Only after calving<br>• All animals are kept in the same group | Yes |
| **Hoof trimming** | | | |
| 29 | On which animals is hoof trimming performed? | • All cows in milk and dry cows | Yes |

| | | | |
|---|---|---|---|
| | | • All cows in milk without dry cows<br>• Only lame cows<br>• All heifers<br>• Only lame heifers<br>• others | |
| 30 | Are footbaths used? | • Yes<br>• No | No, no footbaths used |
| 31 | How often are animals scored for lameness? | • 1-2 times per month<br>• 1-2 times per month with documentation<br>• never | No, all farmers answered the same |
| **Barn Measurements** | | | |
| 32 | Inclined feeding fence? | • Yes<br>• No | Yes |
| 33 | Cubicle Bedding Height? | • Measured on four cubicles on three different places | Yes |
| 34 | Cubicle Bed Length? | • Measured on four cubicles | Yes |
| 35 | Cubicle Width? | • Measured on four cubicles | Yes |
| 36 | Curb? | • Measured on four cubicles | Yes |
| 37 | Brisket Board? | • Measured on four cubicles | Yes |
| 38 | Height of Neck rail? | • Measured on four cubicles | Yes |
| 39 | Neck rail Diagonal? | • Measured on four cubicles | Yes |
| 40 | Abnormal lying behavior in cows? | • Yes<br>• No | Yes |
| 41 | Damaged flooring? | • Yes<br>• No | Yes |
| 42 | Slip-resistant flooring? | • Yes<br>• Partly<br>• No | Yes |
| 43 | Type of flooring? | • Slatted<br>• Solid<br>• Rubber mats | Yes |
| 44 | Steps or obstacles within the barn? | • Yes<br>• No | Yes |
| 45 | Width of feeding alleys? | • ___ | Yes |
| 46 | Width of walking alleys? | • ___ | Yes |
| 47 | Number of drinkers/troughs? | • ___ | Yes |
| 48 | Are areas for lying down clean? | • Yes, more than 2/3 are clean | Yes |

| | | | |
|---|---|---|---|
| | | • No, more than 1/3 is dirty | |
| 49 | Are animals clean? | • Yes, more than 2/3 are clean<br>• No, more than 1/3 is dirty | Yes |
| 50 | How many cows have injuries or swollen joints? | • ___ % | Yes |

*Figure S1: Mean hourly activity values (in minutes) for sensor parameter 'Rumination' showing no visible reduction for LCS-G 2 and LCS-G 3 cows.*

Figure S2: Mean hourly activity values (in minutes) for sensor parameter 'Eating' showing a visible reduction for LCS-G 2 and LCS-G 3 cows.