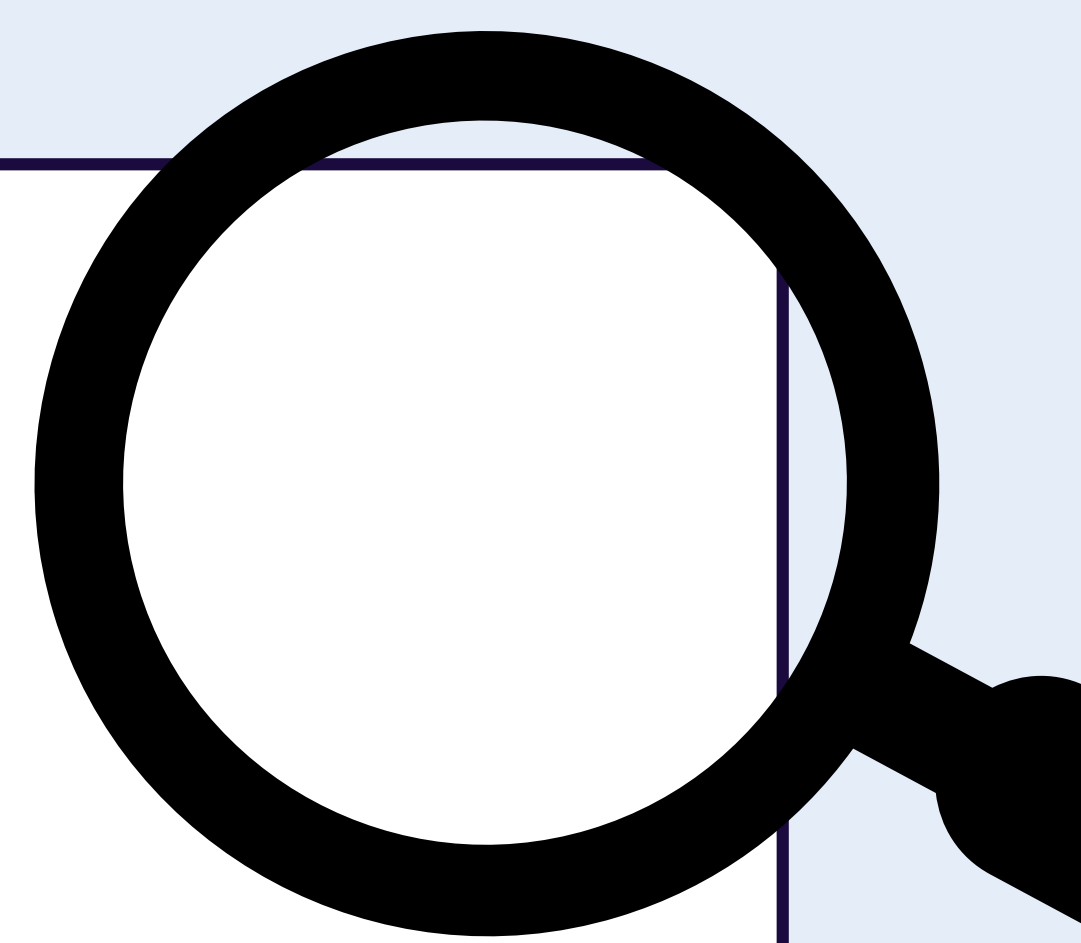




Multiblock modeling: analyzing calf mortality risk factors



Dagni-Alice Viidu¹, Triin Rilanto¹, Stephanie Bougeard², Tanel Kaart¹, Kerli Mõtus¹

¹Institute of Veterinary Medicine and Animal Sciences, Estonian University of Life Sciences, Tartu, Estonia

²Department of Epidemiology, French Agency for Food, Environmental, and Occupational Health Safety, Zoopole, Ploufragan, France

Introduction

Calf mortality is a multifactorial problem and needs to be addressed comprehensively

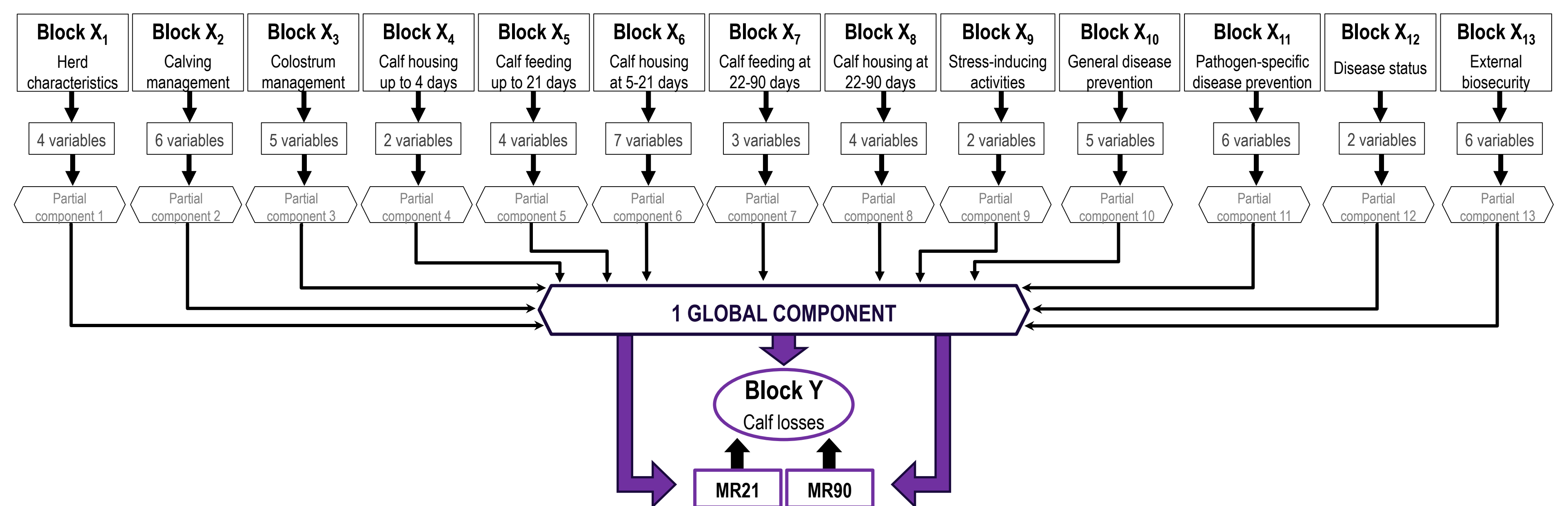
Objective

To analyze a widened list of individual risk factors and thematic areas to assist farmers and veterinarians in prioritizing calf mortality interventions

Methodology

- 118 Estonian dairy herds with ≥100 cows
- Questionnaire, sample collection, on-farm scoring and measurements
- Dataset of 148 questions divided into 13 meaningful blocks
- Yearly calf mortality risk up to 21 days ('MR21') and between 22–90 days ('MR90') used as outcomes
- Multiblock partial least squares regression analysis containing preselected variables

Multiblock analysis



Results

- Average calf mortality risk was 5.9% during the first 21 days and 2.7% during 22–90 days of age
- Most influential thematic blocks contributing to calf losses were “Routine stress-inducing activities”, “Herd characteristics”, “Calving management”, “Calf housing during 5-21 days” and “External biosecurity”
- Poorer cleanliness scores of the calving animals and calves’ having access to outdoor area during the first 21 days of life were most influential variables explaining greater calf losses
- Washing and disinfection of newborn calves’ boxes and testing colostrum quality were protective for MR21 and MR90
- Protective practices for MR21 were related to proper colostrum feeding practices while lower MR90 was mostly associated with efficient external biosecurity practices and vaccination programs

Conclusions

- Most prioritized areas should be timing of stress-inducing activities, calving hygiene and calf housing during the first three weeks
- Good internal biosecurity practices are crucial for achieving lower preweaning period mortality
- Multiblock modelling offers a more comprehensive insight into calf mortality risk factor analysis



Risk factors for MR21

- calf barn age >20 years
- letting the calf suckle first colostrum
- bucket feeding calves during the first three weeks
- dehorning all calves (compared to only heifer calves)
- dehorning at 21-29 days of age



Risk factors for MR90

- using calving pens for sick animals
- opportunity for feces to spread between calf pens
- early introduction of calves to large group pens and higher in-pen age difference
- using automatic milk feeders and feeding waste milk during the first three weeks
- absence of forced ventilation during the first three weeks

