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## **Calf mortality in semi-domestic reindeer (*Rangifer tarandus*) in a Scottish herd: the impact of maternal age and individual differences between cows**

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### **Abstract**

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High calf mortality rate is a significant problem facing semi-domestic reindeer (*Rangifer tarandus*) production around the world. Mortality rates, commonly due to predation, can range from 5 to 70%, which constitutes a great welfare concern. This study examined the influence of quantifiable maternal characteristics on reindeer calf survival. Data were compiled from 18 years' worth of records on the survival of calves in the Cairngorm reindeer herd (Scottish Highlands, UK). Overall, mortality rate of calves ( $n = 635$ ) in the herd was 34.9% to six months old, rising to 47.8% by one year old. For both Total Calf Survival (including perinatal losses) and Post-natal Calf Survival (excluding perinatal losses) of calves up to six months old, the only maternal trait found to significantly influence calf survival was the age of the cow at calving. Calves of very young and old cows showed higher mortality rates. Only 40% of the cows were associated with 77% of calf deaths and it was demonstrated that there were significant individual differences between cows in relation to their ability to consistently rear calves successfully. These findings can be applied to reduce calf mortality within herds, guiding selection towards females with successful reproductive histories and with ages falling in the prime productive range (3–11 years old). Additionally, annual variation had a highly significant influence on calf survival with rising mortality over the recorded period, indicating a role of environment on survival and an avenue for further research to investigate the impact of external factors, such as climate and pathogen load on post-natal loss.

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