

Not on papers list

Farmed deer herd health and production profiling : 2. Factors determining reproductive success of adult hinds

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During a two-year observational study of 15 red deer (*Cervus elaphus*) farms, 3487 adult deer hinds were categorised as early-pregnant (conception before 1 May), late-pregnant or non-pregnant using ultrasonography (Revol & Wilson, 1991). Grazing and mating management of hind groups, environmental factors and individual hind characteristics were recorded as potential risk factors in reproductive success.

Preliminary data analyses were carried out to identify associations between single descriptive variables and early conception or overall conception. Variables which showed sufficient evidence of an association in these analyses ($P < 0.20$) were included in multi-variable logistic stepwise regression analyses (Hosmer & Lemeshow, 1989) with a 5% significance limit for inclusion and removal of variables from the model. A series of path models were formulated to identify risk factors which had statistically significant direct and indirect effects on each outcome (Pedhazur, 1982). All statistical analyses were carried out with the SAS computer package (SAS Institute Inc., Cary, NC, U.S.).

Individual hind characteristics appeared to play a significant role in achievement of conception (early or not), with hinds rearing a calf being approximately 2-3 times more likely to conceive (and conceive early) than hinds not rearing a calf. Pre-mating body condition rather than live weight *per se* may be one of the major risk factors influencing conception, which is in accordance with studies in wild deer populations (Mitchell & Lincoln, 1973; Albon *et al.*, 1986). A high probability of conception was also associated with hinds being over 3 years of age at mating

and hinds being of New Zealand origin. Results also suggested a beneficial influence of early weaning and introduction of stags, the use of at least one experienced stag, a modest hind to stag ratio and using back-up sire stags. Avoiding disturbance at mating also may increase the likelihood of conception. Nutritional factors need to be further evaluated.

It must be stressed that the associations found in this study are not proof of causation and further research is required to validate cause and effect. However, this study has identified areas which deserve priority in research and development designed to improve reproductive management techniques. Providing the risk factors identified in this study are controlled and have causal relationships, all adult hinds can be mated before 1 May with an overall 98 to 99% conception rate as has been observed on some farms in this study.

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