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Long-term effects of selection for prolificacy and kit growth on rabbit performance and behaviour

O. Girardie[1,2], R. Robert[1], M. Maupin[1], J. Hurtaud[1], P. Joly[3], J. Ruesche[2], I. David[2], H. Garreau[2] and L. Canario[2]
[1]Hypharm SAS, La Corbière, 49450, Roussay, France, [2]INRAE, Animal Genetics, GenPhySE, 24 chemin de Borde Rouge, 31324, France, [3]ISARA Lyon, Agrapole, 69364 Lyon, France; laurianne.canario@inrae.fr

An experiment was designed to estimate genetic trends for doe and kit performance and behaviour during lactation in response to 22 generations of selective breeding for litter size and direct and maternal effects for weaning weight. The old-type line (L0) was produced from progeny of frozen embryos of the ancestor population. A cross-fostering design was implemented between L0 and the modern-type line (L22) to quantify contributions of direct and maternal effects to kit performance and behaviour. Does raised kits from a single line. None kit was raised by its biological dam. Data collection was performed from a single batch with 52 L0 and 59 L22 does in parity 1 and among them, 28 L0 and 29 L22 does in parity 2. Litter growth and survival were recorded frequently and milk production was measured with the weigh-nurse-weight method at d21. Nest quality and fur plucking were observed on d0 and d1. Willingness to nurse was assessed from doe behaviour before and after nursing on d5 and d8. Reaction to litter removal was analysed on d6 and d28. Kinetics of exit from the nest was daily evaluated from d12 to d29. Two kits per litter were tested in an emergence test at d22 and d25. Performance data and kit behaviour were analysed with a linear model including doe line, kit line, doe parity, litter size and for kit emergence the day of observation, plus a doe random effect. Maternal behaviour was analysed with a logistic regression. At d21, L22 does produced more milk than L0 does (198 vs 159 g, P=0.002) and produced heavier kits (378 vs 350 g, P=0.0005). L22 does had better maternal abilities than L0 does as referred to nest quality (P=0.06), fur plucking (P<0.0001), milk production (P=0.002) and willingness to nurse (P=0.007). As lactation progressed, L22 kits were observed out of the nest in greater proportion than L0 kits, whether they were raised by L0 or L22 does. L22 kits were bolder than L0 kits in the emergence test. Trends in doe behaviour were favourable to litter performance. Kit genetics influenced its performance and behaviour more than dam genetics in advanced lactation.