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Heterosis, direct and maternal genetic effects for litter performance and postweaning growth traits in Gabali rabbits and their crosses raised under hot climatic conditions.

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A crossbreeding experiment was carried out involving Gabali (G) and New Zealand White (NZW) rabbits to estimate direct heterosis and direct and maternal additive effects on some litter traits and post weaning growth. Doe traits on 238 litters were: Litter size and weight at birth and weaning, milk yield at 21 days, total milk yield, and mortality rate at weaning. Data of body weight at 4, 6, 8, 10 and 12 weeks of age on 1300 weaned rabbits were collected. Data were analyzed using a linear mixed model taking A-1 into consideration. Season and parity had considerable effects on litter traits and body weights at different ages. Spring kindlings recorded larger litter size and heavier weight of litter along with lower preweaning mortality than winter kindlings. Also, Spring-born rabbits recorded higher weights of body from weaning up to 12 weeks of age. Effect of teats number of darn constituted a significant source of variation in rabbit's growth at most studied ages. NZW breed had superior performance in terms of litter size and weight compared to G rabbits. Most litter traits and postweaning growth were not significantly affected by direct additive effects. Gabali-sired litters had similar direct additive effects compared to NZW-sired litters and consequently Gabali bucks could be used as sires in crossbreeding stratification systems under hot climatic conditions. Orthogonal contrasts showed that crossbred litters (or rabbits) obtained from mating G bucks with NZW does were generally associated with slight superiority compared to those litters (or rabbits) obtained from the reverse mating. The maternal additive effects on litter size and weight at birth were significantly in favor of Gabali rabbits, while breed maternity for litter traits measured after kindling was significantly in favor of NZW breed. After weaning, growth traits under study were not significantly affected by the maternal additive effects. Crossing of G rabbits with NZW was associated with significant positive direct heterosis for litter size and weight at birth and weaning. Slight negative estimates of direct heterosis were observed for milk yield at 21 days and total milk yield. However, insignificant negative direct heterosis was recorded for postweaning growth traits.

Keywords: Gabali and New Zealand White rabbits, direct heterosis, direct and maternal effects, litter performance, post-weaning growth