



## **Prewaning growth traits of straightbred and crossbred Santa Inês, White Dorper, Ile de France, and Texel lambs in Southeastern Brazil**

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Crossbreeding can be used to improve lamb production in Brazil. The objective of this study was to evaluate birth weight (BW), weaning weight (90-day standardized), and average daily weight gain from birth to weaning (ADG) of straightbred Santa Inês (S), White Dorper (D), Ile de France (I), and Texel (T), F<sub>1</sub> crossbred ( $\frac{1}{2}$  D +  $\frac{1}{2}$  S,  $\frac{1}{2}$  I +  $\frac{1}{2}$  S, and  $\frac{1}{2}$  T +  $\frac{1}{2}$  S), and three-breed crossbred ( $\frac{1}{2}$  D +  $\frac{1}{4}$  I +  $\frac{1}{4}$  S,  $\frac{1}{2}$  D +  $\frac{1}{4}$  T +  $\frac{1}{4}$  S,  $\frac{1}{2}$  I +  $\frac{1}{4}$  D +  $\frac{1}{4}$  S,  $\frac{1}{2}$  I +  $\frac{1}{4}$  T +  $\frac{1}{4}$  S,  $\frac{1}{2}$  T +  $\frac{1}{4}$  D +  $\frac{1}{4}$  S, and  $\frac{1}{2}$  T +  $\frac{1}{4}$  I +  $\frac{1}{4}$  S) lambs born from 2013 to 2019. The F<sub>1</sub> animals were produced in the 2013, 2014, 2015, 2016, and 2017 breeding seasons; the three-breed crossbreds in the 2016, 2018, and 2019 breeding seasons; while the straightbreds S, D, I, and T were produced in all seven breeding seasons. The statistical model 1 for the analyses of variance included the effects of year and month of birth, sex of the lamb (male, female), birth type (single, multiple), genetic group of the lamb (GG), age of dam in months (linear and quadratic), and age of lamb at weaning (linear; only for WW and ADG). In model 2, GG was substituted by the individual heterotic effect ( $h^{iEE}$ ) among the exotic breeds (D, I, and T), and the additive direct ( $g^i_E$ ) and the additive maternal ( $g^{mE}$ ) effects of the exotic breeds all together. All effects included in model 1 significantly affected the traits. The F<sub>1</sub> lambs were heavier (0.31 kg for BW, and 2.11 kg for WW) and gained more weight (0.020 kg day<sup>-1</sup>) than the purebred Santa Inês. The three-breed cross lambs all together were heavier (0.58 kg for BW, and 3.78 kg for WW) and gained more (0.035 kg day<sup>-1</sup>) than the F<sub>1</sub> all together. In model 2, the effects  $g^i_E$  and  $h^{iEE}$  were positive and significant for all three traits, while the effect  $g^{mE}$  was negative and significant only for BW. It can be concluded that crossing D, I or T rams with S ewes can increase weights of lambs, and that the F<sub>1</sub> females can be used to produce three breed cross lambs.

**Keywords:** additive direct effect, additive maternal effect, crossbreeding, heterotic effect, lamb birth weight, lamb weaning weight

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