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# Heritabilities and genetic correlations for reproductive traits in an F2 reciprocal cross chicken population

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**ABSTRACT.** Studies estimating genetic parameters for reproductive traits in chickens can be useful for understanding and improvement of their genetic architecture. A total of 1276 observations of fertility (FERT), hatchability of fertile eggs (HFE) and hatchability of total eggs (HTE) were used to estimate the genetic and phenotypic parameters of 467 females from an F2 population generated by reciprocal crossing between a broiler line and a layer line, which were developed through a poultry genetics breeding program, maintained by Embrapa Swine and Poultry, Concordia, Santa Catarina, Brazil. Estimates of heritability and genetic and phenotypic correlations were obtained using restricted maximum likelihood calculations under the two-trait animal model, including the fixed effect of group (hatching of birds from the same genetic group) and the random additive genetic and residual effects. The mean percentages for FERT, HFE and HTE were 87.91 ± 19.77, 80.07 ± 26.81 and 70.67 ± 28.55%, respectively. The highest heritability estimate ($h^2$) was 0.28 ± 0.04 for HTE. Genetic correlations for FERT

 

with HFE (0.43 ± 0.17), HFE with HTE (0.98 ± 0.02) and FERT with HTE (0.69 ± 0.10) were positive and significant. Individuals with high breeding value for HTE would have high breeding values for HFE and FERT because of the high genetic association between them. These results suggest that HTE should be included as a selection criterion in genetic breeding programs to improve the reproductive performance of chickens, because HTE had the highest heritability estimate and high genetic correlation with FERT and HFE, and it is the easiest to measure.

**Key words:** Genetic association; Fertility; Hatchability; Heritability; White leghorn

 