

PPARGC1A indel polymorphism is associated with performance and carcass traits in chickens

Pértille, F¹; Felício, AM¹; Rosário, MF¹; Silva, VH¹; Mangetti, T¹; Silva, NA¹; Ledur, MC²; Coutinho, LL¹

¹Escola Superior de Agricultura Luiz de Queiroz, USP, São Paulo, SP; ²Embrapa Suínos e Aves, CNPSA, Concórdia, SC.
fabio_pertille@yahoo.com.br

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Peroxisome proliferative activated receptor gamma co-activator 1 alpha (*PPARGC1A* - Gene ID: 422815) plays an important role in the expression of fiber type in skeletal muscles. Previous studies in the Embrapa F₂ Chicken Resource Population identified a QTL between markers *MCW0240* and *LEI0063* associated with body weight at 35 and 41 days on chromosome 4, *PPARGC1A* is located. The aim of this study was to identify *PPARGC1A* polymorphism and associate it with poultry traits in the same F₂ chicken population. Primers were designed in an intronic *PPARGC1A* region and 11 F₁ individuals (6 families) were sequenced to detect polymorphisms. One 6bp *indel* was identified in the intronic region. To test the association of this *indel* with performance traits 274 F₂ were selected from the three most informative families and genotyped with fluorescent primers. Three genotypes were obtained: 0 - two 165bp fragments, 1 - 165bp and 171bp fragments and 2 - two 171bp fragments. Associations between genotypes and phenotypes were carried out within family using the GLM procedure from SAS, with the fixed effects of sex, hatch and SNP. In the first family, we found genotypes 1 and 2 that were associated with weight gain and feed intake at 35-41d, head, gizzard, feet, liver, wings, legs (thighs and drums) and heart ($p < 0.05$). In the second family, genotypes 0 and 1 were found and associated with liver ($p < 0.05$). In the last family, genotypes 1 and 2 were associated with feet, gizzard, liver and intestine length ($p < 0.05$). Genotype 1 provides the smallest mean values for all traits for the three families assessed. The identified *PPARGC1A indel* will be validated in commercial chicken populations before it can be used in marker assisted selection in poultry breeding programs. Financial Support: FAPESP.