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Genotype by environment interaction for carcass traits and intramuscular fat content in heavy Iberian pigs fattened in two different free-range systems

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Abstract

Genotype by environment interaction (G × E) is a potential source of reduced efficiency in genetic improvement programs in livestock. The objective of the current work consisted of checking the existence of G × E interaction in carcass traits and in intramuscular fat content (IMF) in Iberian pigs fattened in two free-range systems. Genetic component and estimated breeding values (EBV) of the percentage of hams, shoulders and loins and IMF in loin were obtained from records of 4,348 and 1,818 pigs fattened in campo (C) and montanera (M) systems, respectively. A multitrait model where the performances of each system are considered as different traits was implemented. Three selection indexes were built with different treatments about the quality trait, two of them based in the optimal trait theory. The Pearson correlation between EBV and indexes and the Spearman correlation between the rankings of progenies of 21 boars fattened in both systems were calculated. Heritability results were different in both systems (h2 range from 0.43 to

0.66 and from 0.24 to 0.33 in C and M system, respectively) and genetic correlation of same traits expressed in the two systems also pointed out to a weak G × E interaction (0.64, 0.67 and 0.66 in hams, shoulders and IMF, respectively). Pearson and Spearman correlations were always significantly different to 1. The obtained results advised to consider this G × E interaction in the analysis model of a breeding program focused on free range production system and to include IMF in the index selection assuming an optimum range for this quality trait, in order to avoid negative effects of selection for carcass performances.

Keywords

premium cuts; intramuscular fat; breeding values; economic values

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DOI: 10.5424/sjar/2014122-4840