

A SURVEY OF RELATIONSHIPS
AMONG RARE BREEDS OF SWINE

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ABSTRACT

Extinction of rare breeds of livestock threatens to reduce the total genetic variation available for selection in the face of changing environment and new diseases. Swine breeds facing extinction share characteristics such as small size, slow growth rate and high fat percentage which eliminate them from contributing to commercial production. Compounding the risk is lack of pedigree information which increases the chance that producers are breeding closely related individuals. By making genetic data available, producers can make more educated breeding decisions to preserve genetic diversity in future generations, and conservation organizations can prioritize investments on breed preservation investments. Genotypes from Porcine 60k SNP chip were obtained for Guinea, Ossabaw Island, Red Wattle, American Saddleback, Mulefoot, British Saddleback, Duroc, Landrace, Large White, Pietrain and Tamworth pigs. PLINK was used to construct a genomic relationship matrix and to calculate inbreeding coefficients for the animals within each breed. Relatedness (R) and average inbreeding coefficient (F) differed among breeds, with pigs within rare breeds generally more closely related and more inbred ($P < 0.05$ for both). PLINK was also used to create a multidimensional scaling diagram based on the SNP genotypes. Animals within breeds clustered tightly together except for two Guinea. Tamworth, Duroc and Mulefoot tended to not cluster with the other seven breeds.