

学 位 論 文 要 旨

氏 名

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題 目

Studies on breed characteristics and genetic structure of indigenous Agu pig

Agu is indigenous to Okinawa, the southernmost island in Japan. The objective of this study was to reveal breed characteristics and genetic structure of the Agu pig

1. Analysis of body measurements

Agu pigs were similar in size to Puitan, Jinhua and Taoyan, the medium-sized Chinese breeds. The body shape was different, however; Agu pigs had a stubby shape and a thick chest girth compared with their body length.

2. Analysis of reproductive traits and structure

Total number born (TNB), number born alive (NBA) and number weaned (NW) of Agu sows was smaller than half the number of European breeds; Agu sows had lower survival rate at birth (SVB), survival rate at weaned (SVW) and higher PMF than European breeds. The least square means of average weaning weight (AWW) and litter weaning weight (LWW) were lower in Agu sows than those in European breeds. Inbreeding depression on TNB, NBA was observed in Agu pigs of Okinawa livestock research center.

3. Maternal lineage of Agu pig inferred from mitochondrial DNA control region

The Agu pig population has East Asian and European maternal lineages that most Agu individuals possess East Asian haplotypes. Our results supported the hypothesis that the ancestors of the Agu pig were introduced from the Asian Continent.

4. Evaluation of genetic structure of Agu pig using microsatellite markers

The present study showed that the Agu pig possesses unique genetic structure because of bottleneck event and isolation from other pig breeds after 1980s. In addition, the Agu pig had low genetic diversity.

5. Breed characteristics of Agu pigs: Growth performance, carcass traits and meat quality

Raw Agu meat had lower water holding capacity, lower cooking loss, higher pressed juice percentage in cooked meat and more intramuscular fat than did that of LWD pigs. Moreover, the inner layer of Agu backfat contained a higher proportion of monounsaturated fatty acids, a lower proportion of polyunsaturated fatty acids and had a lower melting point. The results suggested that the Agu pig is a breed capable of producing choice pork, despite low growth performance and carcass traits.

6. Genome wide association study of meat quality traits in an F2 Agu × Landrace population using high density DNA Chips.

In this study, many QTLs were detected meat quality traits such as water holding capacity, cooking loss and fatty acid composition. This study provides useful information for marker-assisted selection in Agu population because some of the SNPs (QTLs) varied in F0 Agu sires.