

SCREENING ON SPERM CHROMOSOMAL BREAKAGE AND OXIDATION LEVEL OF YOUNG BREEDING BOARS

Ting-Yung Kuo¹, Hsiu-Luan Chang² and Ming-Che Wu¹

¹Division of Breeding and Genetic, Livestock Research Institute, Tainan, Taiwan

²National Ping Tung University of Science and Technology, Pingtung, Taiwan

Introduction

High standards of semen quality and non-reduction in sperm fertility in livestock are of economic relevance due to its association with fertility and offspring results for animal industry. The objective of this study was to screen and estimate genetic parameters and genetic trend for new sperm parameters such as sperm chromosomal breakage and oxidative damage of on-farm young breeding boar.

Materials and Methods

124 ejaculates collected from 40 Duroc, 24 Landrace and 16 Yorkshire boars. The data was collected over 2 years (2014-2015) from a breeding farm located in the north part of Taiwan. New sperm parameters of semen quality traits considered per ejaculate were % of intact membrane spermatozoa (VA), viable and intact acrosomal status (AS), mitochondrial activity (MA), DNA compaction (DC) and viable nonoxidized (NO) were assessed with Flow cytometry (Guava easyCyte microcapillary flow cytometer with CytoSoft software; Guava Technologies Inc., Hayward, CA, USA; distributed by IMV Technologies). Genetic heritability parameters and new sperm parameters were estimated by VCE6.0 with the univariate model of Restricted Maximum Likelihood.

Results and Discussion

Heritability estimates of VA, AS, MA, DC and NO were 0.33, 0.42, 0.22, 0.08 and 0.41 respectively. Genetic correlations among those of new sperm parameters of flow cytometric measurement varied from -0.451 to 1.0 among breeds of pigs. In summary, the deterioration of genetic ability indicated that new sperm parameters should be taken into account for boar selection at young age and may further to improve and enhance the overall fertility of breeding boars.