

IVF Techniques for Assessing Semen Quality and Boar Fertility

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In the swine industry a single male has a more significant impact on efficiency and productivity than an individual female, and this impact is higher with the use of artificial insemination (AI). At AI centers, routine semen assessment includes the evaluation of sperm characteristics such as concentration, morphology, viability, and motility. Some of these characteristics can be useful to detect male reproductive disorders that result in low fertility rates. In the last few years semen assessment techniques for predicting male fertility potential, rather than simply infertility, have been studied.

In each of the first two replicates of the present study, ejaculates from three boars were evaluated (B-1, R-1, G-1; R-2, G-2, and Y-2). Each boar was collected twice a week for a period of 8 months. The first sperm rich fraction was evaluated (motility, morphology and concentration), diluted to 1.5 billion of morphologically normal sperm per 50-mL dose and used to breed approximately equal numbers of gilts over the same period. Semen samples were collected six times during the breeding period for evaluation in a standardized *in vitro* fertilization (IVF) system. Differences among boars were noted in several *in vitro* characteristics including penetration rate (B-1 90.58%, R-1 77.13%, G-1 46.20%; R-2 88.86%, G-2 77.15%, and Y-2 99.28%, $P < 0.0001$) and polyspermy (B-1 75.5%, R-1 46.09%, G-1 30.70%; R-2 81.70%, G-2 66.9%, and Y-2 97.78%, $P < 0.0001$). Litter size also varied among boars (B-1 10.67, R-1 10.25, G-1 7.85; R-2 11.17; G-2 9.47, and Y-2 11.86, $P < 0.0001$) and will be correlated with the *in vitro* results.

Implication

In vitro characteristics such as penetration rate and polyspermy could be useful indicators of boar fertility.