

**EFFECT OF FEED QUALITY AND MICROBIOLOGICAL
CONTAMINATION ON THE REPRODUCTIVE HEALTH OF
BREEDING BOARS**

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Reproductive performance in breeding boars is influenced not only by the genetic and physiological characteristics of the sires, but also by environmental factors, including feed quality, drinking water hygiene, and the level of microbiological contamination within the production unit. The aim of the present study was to assess the microbiological quality of semen, feed, and drinking water in an intensive swine-breeding farm, as well as to identify potential sources of contamination with an impact on reproductive health and the biological quality of semen.

The study was conducted on high genetic merit breeding boars of Pietrain breed and PIC hybrid lines, maintained under intensive housing conditions in controlled microclimate facilities. The animals received a complete and nutritionally balanced diet composed of wheat (30%), barley (25%), soybean meal (14.85%), maize grain (13%), sunflower meal (5%), wheat bran (5%), fishmeal (1.5%), soybean oil (1.2%), and mineral-vitamin premixes with functional feed additives. The ration provided 12.93 MJ/kg metabolizable energy and 180.8 g/kg crude protein, along with adequate levels of essential amino acids, macro- and microelements required for the maintenance of reproductive function and the production of high-quality semen.

Microbiological analyses were performed on semen samples collected from genetically superior breeding boars, as well as on pelleted feed and drinking water samples. The main hygiene and safety indicators were determined, including total viable count (TVC), the presence of *Escherichia coli*, *Enterococcus* spp., *Proteus* spp., *Staphylococcus* spp., and total fungal count (TFC). The results were interpreted according to veterinary sanitary standards and guidelines applicable to swine artificial insemination and breeding centers.

The findings revealed significant microbiological contamination across several sample categories. Semen collected from Pietrain boars showed a total bacterial count of 2.8×10^4 CFU/mL, exceeding the recommended threshold for semen use in assisted reproductive programs ($\leq 10^4$ CFU/mL). In both ejaculate samples, bacterial genera such as *Escherichia*, *Enterococcus*, *Proteus*, and *Staphylococcus* were identified, indicating fecal contamination and suggesting deficiencies in hygiene practices during semen collection, processing, and handling.

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Microbiological examination of pelleted feed revealed elevated contamination levels of *Staphylococcus* spp. (6.1×10^5 CFU/g) and filamentous fungi (4.8×10^5 CFU/g), indicating inadequate storage and preservation conditions. These results suggest an increased risk of mold development and, consequently, mycotoxin contamination, compounds well known for their negative effects on reproductive function, semen quality, and immune status of breeding males.

Water analysis revealed an exceedance of admissible microbiological limits for all investigated indicators. High values were recorded for *Escherichia coli* (2.4×10^2 CFU/mL), *Enterococcus* spp. (2.8×10^2 CFU/mL), and total viable count (3.8×10^5 CFU/mL). These findings indicate significant fecal contamination of the water source or distribution system and suggest possible development of microbial biofilms within pipelines and drinking equipment, negatively affecting animal health status and reproductive performance.

In conclusion, although the breeding boars were provided with a nutritionally balanced ration formulated to support reproductive function and high-quality semen production, the microbiological quality of semen, feed, and drinking water was unsatisfactory. The study highlights the necessity of implementing strict biosecurity and hygiene programs in boar breeding operations, including regular microbiological monitoring of semen, quality control and proper storage of feed, sanitation of watering systems, and preventive measures aimed at reducing fungal contamination and mycotoxin exposure. These measures are essential for maintaining the reproductive health of high genetic merit boars and for achieving optimal outcomes in artificial insemination and genetic improvement programs in swine production.

Keywords: *boars, semen, breed, contamination, microbiology, hygiene, fungi, feed.*