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**The combination antimicrobial agent between antimicrobial peptide (PA-13) and gentamicin for inhibits *E*. *coli* isolated from boar semen**

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**Abstract:**

**Background/Objective:** Artificial insemination (AI) is a common used technique in the swine industry to preserve liquid boar semen. Bacterial contamination after insemination may cause a deleterious effect on the quality of the semen, decreasing the rate of pregnancy and increasing the risk of endometritis in gilts and sows, as well as death of the embryo or fetus. Many antibiotics are typically combined and added in semen extender to prevent bacterial growth and minimize the negative consequences of contamination. Many antimicrobial peptides (AMP) have demonstrated the ability to inhibit the growth of both Gram positive and Gram negative. Low-concentration of antibiotics combined with AMP was studied in order to optimize the effectiveness of inhibiting bacterial growth and diminish the negative impacts of AMP on sperm. The purpose of this research was to investigate the potential of a combination between a synthetic AMP (PA-13) and gentamicin to inhibit *E. coli* isolated from boar semen.

**Methods:** *E. coli* that was isolated from boar semen was incubated with the mixed of 3.096 µg/mL of PA-13 and 100 µg/mL of gentamicin. After incubate, the OD600 values were measured every hour for a 24-hour period at 37°C in order to generate the growth curve. PA-13 and gentamicin combined were compared to either PA-13 or gentamicin individually (7.813 and 200 µg/mL).

**Results:** The results showed that a mixture of 3.096 µg/mL of PA-13 and gentamicin 100 µg/mL can inhibit *E. coli* growth better than using PA-13 (7.813 µg/mL) alone. In addition, the inhibitory effect of the combination was similar to that of gentamicin at 200 µg/mL.

**Conclusion:** The mixed antimicrobial agent between PA-13 and gentamicin has ability to inhibit *E. coli* growth similar with gentamicin alone, resulted in reducing gentamicin concentration. This study revealed the alternative method to reduce antibiotic used in semen extender by combining with antimicrobial peptide.

**Keywords:** Antimicrobial peptide, *E. coli*, Boar semen