

THE PIG APPEASING PHEROMONE (PAP): EFFECTS ON BEHAVIOR AND PERFORMANCES

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Introduction and Objectives

In addition with the separation from their dam (weaning), piglets have to experiment other stress. Several studies (1, 2, 3) demonstrate that bad handling, high densities boxes or mixing piglets have an impact on performances. It has also been demonstrated that piglets' depression of growth predisposed animals to bad behavior. Daily Weight Gain (DWG) post weaning is possibly a parameter linked with the level of stress caused by the separation. A maternal appeasing pheromone, known as PAP (Pig Appeasing Pheromone) have been isolated. The aim of this paper was to review the different results obtained with PAP.

Chemistry/Molecular Biology

PAP is a synthetic mixture of fatty acids in a specific solvent. The aim of this product is to have a similar action compare to the real pheromone. Molecular biology studies show that a binding protein of which the structure has been discovered transports this pheromone.

Materials and Methods

Weaned piglets are gathered at 26 days of age (noted D0) and sold at around 60 days of age. In all trials, animals are breed the same way. For Trials 1 & 2, technical performances are observed. Behavior has been observed for Trial 3. At D0, mean weights, sex ratio and number of animal are similar. Each box is treated either with the placebo or the PAP. In Trial 1, first group is the placebo (P) for which the solution is sprayed daily. Second and third groups are the tested ones: daily application (D) and "twice a week" (W). Treatment starts on D0. The duration is of 5 weeks after weaning. Individual Weights and average Daily Weight Gains (DWG) are observed. Trial 2 has been built to test another shell for the PAP. Instead of spraying, a slow releasing shape (one bloc last 4 weeks) is tested. Same parameters are analyzed for both groups (P vs PAP). For Trial 3, each of the 2 boxes is sprayed as in Trial 1 (daily vs placebo). The duration is of 72 hours after weaning (T0 to T72). Observed parameters are: number of biting, duration of fights, game sequences and ratio biting/touching. Differences between means were analyzed by either a t-test or a U (Mann-Whitney) test.

Results

Over D0 to D36 period in Trial 1, differences in DWG are of significant for D vs W ($p < 0.05$), D vs P ($p = 0.051$), but not for W vs P. Male DWG are comparable among groups but females from D group have significantly better DWG compared to W and P ($p < 0.05$ for both D vs P and D vs W). In Trial 2, PAP had better DWG than placebo (ns, $p = 0.13$) over the D0 to D65 period. In Trial 1, difference in mean weights is statistically significant for the last weighting (D heavier than to P, $p < 0.005$). D is comparable to W and W is not statistically different from P. Differences

exist among sexes: on D21, only females have higher individual weights (D vs P, $p = 0.056$). It is also the case on D28, for the same groups ($p = 0.073$). A calculation of average weights during the length of the treatment (D0 to D36) shows that pigs from D group are heavier than P ones ($p < 0.1$) but that W and D are comparable, as well as W and P. Average weights are comparable among groups for males, while this is not the case for females (D > P, $p = 0.053$). In Trial 2, IW are statistically different on D20 ($p < 0.001$) and still of tendency on D65 ($p = 0.097$). Over the whole period, animals from PAP group are heavier than P ones ($p = 0.070$) in Trial 3. There are more wounds in the placebo group compare to the PAP for T0 to T5 ($p < 0.0001$). The difference is of tendency for the T0 to T72 period. Placebo group presents higher length of aggressions compare to PAP ($p < 0.0001$). PAP treated animals positively interact more often than the placebo ones: average number of games sequence is higher ($p < 0.01$). The ratio biting/touching is lower in the PAP treated group ($p < 0.001$).

Discussion

A daily utilization of PAP seems to allow weaned piglets to recover a known atmosphere (here maternal). Thus, the use of PAP to a larger extend is possible. For example, a stressing situation (transportation) has no behavioral effects on sheep if they recover their initial environment after a stress (4). A similar type of results has been observed in veal calves production (5). The fact that these lasts were significant only in a closed atmosphere shows that spreading a molecule like a pheromone needs a relatively closed location. Thus, by using PAP (or another appeasing pheromone), the observed effects could permit piglets (or other animals) to be moved without stress consequences. Several other perspectives can be added to the latter: medicine alternative, organic image... Other criterions should be analyzed to test effects of PAP: food conversion index (FCI), DGW until slaughter, meat quality or improvement of fertility and prolificacy (shown by 6 on rabbits). Finally, to catch the producers' demand, a calculation of the potential financial gain using PAP should be computed.

References

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