**PO-177**

**Improved early piglet survival after Metacam® treatment of sows post farrowing**

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**Introduction**

In humans, it is documented that involutio uteri results in post labour pain 10-12 hours after giving birth. This affects not only the wellbeing of the mother, but also the lactation. In sows, involutio uteri might give the same pain, and this could decrease the willingness of the sows to feed the piglets and the amount of milk available in the first critical days of the piglets’ life.

The present study was designed a side-by-side (SBS) study to test the above theory by treating sows with NSAID in the first hours after farrowing, using the number of piglets dying the first 5 days after farrowing as the effect parameter.

**Materials and Methods**

The study was carried out in 6 Danish sow herds. The herds were randomly selected among herds in a Danish veterinary practice with between 600 and 1500 sows and without specific disease problems.

In each herd, the sows were divided in two groups: Group 1 sows with even numbers and group 2 sows with uneven numbers. Group 1 was treated with NSAID (Metacam® 20 mg/ml, Boehringer Ingelheim) 1 ml/50 kg im. the day of farrowing and again the next morning. Group 2 were non-treated controls. Besides the NSAID, sows were handled as usual in the individual herds.

Data were collected by the farmer and included litter number, date of farrowing, whether the farmer had to help the sow giving birth, number of live- and deadborn piglets, number of pigs placed at the sow to raise and number of piglets left at the 5th day. For evaluation, the litters were divided in litters without piglet mortality and litters with 1 or more dead piglets during the first 5 days. Statistical comparison was made with $\chi^2$-test with $p=0.05$ as level of significance.

**Results**

Totally, 846 sows were included (table 1). Sows from the 2 groups were comparable except for % of sows given help for birth. Piglet survival was significantly better ($p<0.0001$) after NSAID treatment of sows, and the number of litters with piglet mortality decreased from 62% to 48% in the treated group. The improvement was even bigger for sows given birth help ($p<0.01$) (Figure 1).

**Table 1.** Survey of SBS study of piglet survival with and without NSAID treatment of sows post partum

<table>
<thead>
<tr>
<th></th>
<th>Metacam</th>
<th>Non-treated</th>
</tr>
</thead>
<tbody>
<tr>
<td># sows</td>
<td>420</td>
<td>426</td>
</tr>
<tr>
<td>Litter No.</td>
<td>3,0</td>
<td>3,2</td>
</tr>
<tr>
<td>Liveborn</td>
<td>15,0</td>
<td>15,1</td>
</tr>
<tr>
<td>Deadborn</td>
<td>1,7</td>
<td>1,5</td>
</tr>
<tr>
<td>Piglets to raise</td>
<td>13,4</td>
<td>13,4</td>
</tr>
<tr>
<td>% birth help</td>
<td>19,5</td>
<td>21,1</td>
</tr>
<tr>
<td># dead before day 5</td>
<td>0,8</td>
<td>1,1</td>
</tr>
</tbody>
</table>

**Figure 1.** Piglet mortality the first 5 days after birth with and without NSAID treatment of the sows in sows given birth help compared to no birth help.

**Discussion**

NSAID treatment of sows post partum significantly improved piglet survival in the first 5 days, supporting the theory that sows suffer from post labour pain. The effect was most pronounced after birth help, probably because involutio uterus is more painful here. Hence, post partum sows should at least be treated with NSAIDS after birth help to improve sow welfare and piglet survival.
Reducing the incidence and treatment of meningitis caused by *Streptococcus suis* in weaner pigs by adapting the environment

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The farm had a history of confirmed *Streptococcus suis* meningitis outbreaks in the post weaning period. Treatment with in-water and injectable potentiated amoxicillins along with the reduced performance and mortality of weaners was proving costly. It was decided to modify the weaner’s environment to reduce the dependence on medication. 140 Piglets were weaned at 4 weeks of age from indoor solari pens into a modified “poultry arc” with straw bedding. The weaner feed contained amoxicillin. Meningitis outbreaks usually started around day 5 post-weaning. The main stressor suspected of triggering an outbreak was chilling of the weaners and temperature fluctuations in the building. Modifications were introduced to reduce the chilling of the weaners. An artificial ceiling was constructed from tarpaulin on a roller with an incline of 15° in the autumn. The false ceiling reduced the volume of air the weaner bodies would have to heat by radiation, and the incline ensured that passive ventilation could still occur with fresh air being drawn in from the inlets.

Post modification Tiny tag® temperatures were taken to monitor any improvements resulting from the modifications. The average temperature was 24°C with a range of 17 to 28°C. The temperatures were more stable than prior to modification.

**Figure 1.** Temperature recordings post modification in December.

After a year had elapsed, the medication records for the farm was analysed to find out whether there had been a reduction in the numbers of weaners treated for meningitis.

**Results**

Since modifications took place in August 2010 there has been no outbreaks of meningitis.

Treatments in 2009 and 2010 occurred in 2309 individuals on average. In 2011 only 3 individuals were treated for meningitis. Comparing a year pre modification (August 2009 to 2010) to the year after (August 2010 to August 2011), the difference in treatment numbers was statistically significant P value = 0.02.

**Conclusion**

Post modification of the “poultry arcs” nursery accommodation, the temperatures in the weaner’s sleeping area was warmer during winter months and less daily temperature fluctuation was observed. On this farm modifying the weaner’s environment made a positive impact on weaner health, reducing the incidence and prevalence of *Streptococcus suis* meningitis.
The effect of the application of mono-lauric acid with glycerol mono-laurate in weaned piglets, on the use of antimicrobials in sow herds

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Introduction
After years of an increasing use of antimicrobials on pig farms the Dutch government obliged the pig industry to reduce the use of antimicrobials by 20% in 2011 and by 50% by 2013. This obligation triggered the increasing interest in alternatives for antimicrobials such as mono-laurate. The Dutch firm Daavision B.V. produces a product called Daafit which is a mixture of lauric acid and glycerol-mono-laurate. This product is used in a dose of 1 kilogram per 1000 kilogram of compound feed in weaned piglets. Aim of this additive is to reduce the number of bacteria circulating among these weaned piglets, especially Streptococcus suis. As a result of a lower number of bacteria circulating among these weaned piglets, especially Streptococcus suis. As a result of a lower number of bacteria circulating among these weaned piglets, the sickness in piglets and infections can be reduced. 

Material and methods
Veterinary Practice Lintjeshof has compiled a dataset of circulating bacteria fewer treatments with antimicrobials was calculated according to the guideline given by the Veterinary Medicine at Utrecht University as described in the MARAN report 2009. The DD/AY has been calculated for farms the Dutch government obliged the pig industry to reduce the use of antimicrobials by 20% in 2011 and by 50% by 2013. This obligation triggered the increasing interest in alternatives for antimicrobials such as mono-laurate. The Dutch firm Daavision B.V. produces a product called Daafit which is a mixture of lauric acid and glycerol-mono-laurate. This product is used in a dose of 1 kilogram product per 1000 kilogram of compound feed in weaned piglets. Aim of this additive is to reduce the number of bacteria circulating among these weaned piglets, especially Streptococcus suis. As a result of a lower number of bacteria circulating among these weaned piglets, the sickness in piglets and infections can be reduced.

Results
Table 1. Descriptive statistics of DD/AY before and during use of Daafit and delta-DD/AY for test and control farms

<table>
<thead>
<tr>
<th>Test Herds</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD/AY before</td>
<td>33</td>
<td>34.3</td>
<td>31.0</td>
<td>2.6</td>
<td>118.5</td>
<td>24.6</td>
</tr>
<tr>
<td>DD/AY after</td>
<td>33</td>
<td>24.4</td>
<td>23.4</td>
<td>1.5</td>
<td>84.8</td>
<td>19.3</td>
</tr>
<tr>
<td>Delta-DD/AY</td>
<td>33</td>
<td>-9.8</td>
<td>-8.2</td>
<td>-34.1</td>
<td>11.0</td>
<td>10.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control herds</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD/AY before</td>
<td>29</td>
<td>41.8</td>
<td>28.0</td>
<td>2.9</td>
<td>210.8</td>
<td>42.8</td>
</tr>
<tr>
<td>DD/AY after</td>
<td>29</td>
<td>39.9</td>
<td>27.8</td>
<td>2.8</td>
<td>198.0</td>
<td>38.8</td>
</tr>
<tr>
<td>Delta-DD/AY</td>
<td>29</td>
<td>-1.9</td>
<td>1.7</td>
<td>-45.3</td>
<td>39.2</td>
<td>18.5</td>
</tr>
</tbody>
</table>

The Two sample Wilcoxon rank-sum (Mann-Whitney) test of delta-DD/AY for test (“yes”) and control (“no”) farms showed a significant difference (z=2.674, P=0.0075).

Discussion
This method of data-analysis in which antimicrobial use in the periods before and during the application of a certain product in test and control farms are being compared with one another, can only be seen as an indication of the efficacy of this product. In the test design and the statistical analysis we did not correct for the many factors which might have an influence on the change of DD/AY e.g. herd size. Also, the test design was not randomized and blind so a “placebo effect” can not be ruled out in this study. This is why a definite conclusion on the causality between the use of Daafit and the improvement of the DD/AY based on these data is not possible. However, these data show that the effect of Daafit on the reduction of DD/AY in the test herds can not be ruled out and that Daafit might help in the reduction of the use of antimicrobials on sow farms.

Conclusion
The daily dose per animal year (DD/AY) was reduced by approximately 8 days in the test sow herds. This is a significant difference from the control sow herds.

Recommendation
Randomized double blind studies are necessary to confirm these results.
PANACUR® AquaSol - a new and innovative formulation for use in drinking water

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Introduction
PANACUR® AquaSol and SAFE-GUARD® AquaSol (both 20% w/v Fenbendazole (FBZ) suspensions) are improved pharmaceutical formulations of PANACUR® which has been used successfully for many years as a dewormer in a wide range of animal species. The formulation was improved by optimizing the manufacturing process, resulting in smaller particles and a more homogeneous particle size. The major advantage is a significantly increased ease of use in drinking water for up to 24 hours, without the need for stirring. The indications are the treatment and control of infections with Ascaris suum (adult, intestinal and migrating larval stages) and Oesophagostomum spp. (adult stages).

Materials and Methods
Several studies were performed to demonstrate that PANACUR® AquaSol provides a homogeneous suspension at various concentrations, and that the resulting medicated water is physically and chemically stable under laboratory, as well as field conditions. This was confirmed using various representative water medication systems (predilution tank equipped with a dosing pump, medicated tank) and water supply systems and different water qualities. The medicated water was dispensed from the predilution tank into a pipe system by an electronic dosing pump at various injection rates. During administration, the medicated water in the predilution tanks was not stirred. For both systems, the administration period was set to eight hours, during which samples were taken from the bottom and top of the tanks, as well as from the end of the pipe, at nine different set times. Pipe trials were also performed to benchmark PANACUR® AquaSol against a competing product. During the field studies, samples of medicated water were taken every 30 to 60 minutes from the bottom and the top of the tank and from predefined nipples along the supply system. The content of the tank was not stirred throughout the whole administration period. Tank and nipples were inspected for any sediment formed by the active or any of the excipients. Additional water samples were taken approximately 24 hours after the administration to look for any potential FBZ residues. The physical stability of PANACUR® AquaSol in medicated water was evaluated using the Turbiscan® Lab technology and all water samples were subsequently analyzed for FBZ content using a validated HPLC method. Accurate dosing was proven by the analysis of consistent FBZ concentrations over administration periods of up to eight hours in field trials, and for at least 20 hours in the laboratory.

Results
The studies conducted to evaluate the physical stability of PANACUR® AquaSol in medicated water showed that all samples were physically stable for at least 20 hours. The studies to evaluate the homogeneity and stability of PANACUR® AquaSol in predilution tanks, and medication tanks connected to a water pipe, confirmed the nominal FBZ concentration. The benchmarking study demonstrated that mixing and administering the competing product (according to the manufacturer’s instructions) resulted - by contrast with Panacur AquaSol - in the contents of the dilution tank being distinctly heterogeneous (>25% variability against 0.6% for PANACUR® AquaSol), and a revealed huge discrepancy in concentration between the beginning and end of the pipe trial (>70% difference compared to <1% for PANACUR® AquaSol) proving PANACUR® AquaSol to be of superior quality.

All analytical results of the field studies confirmed the expected concentrations. Consistent FBZ concentrations were achieved in the tanks and along the water pipes over the whole administration period. No sedimentation was found at the bottom of the tanks, and no particles observed floating on the surface. The water samples taken 24 hours after the administration contained no measurable FBZ, indicating that PANACUR® AquaSol did not leave FBZ residues in the drinking water system.

Conclusions and Discussion
Both laboratory and field studies demonstrated that PANACUR® AquaSol guaranteed a homogeneous distribution of FBZ in the medicated water and throughout the supply systems. The suspension was physically and chemically stable over a time frame up to 24 hours.

Compared with the competitor tested against it, PANACUR® AquaSol was shown to be the superior product, and better suited to this type of application.
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Improved productivity and reduced antimicrobial use in a Danish sow herd using circovac as a sow vaccine against PCV2

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Introduction
Vaccinating sows against PCV2 can have a positive effect on offspring in regards to better production results 1,2,3. In this study the long term effect of vaccination of sows against PCV2 is shown.

Materials and Methods
Sows on a Danish SPF farm with Mycoplasma but not PRRS and AP were vaccinated against PCV2 with a two-shot vaccine (Circovac®) approved for sow vaccination. Sows were vaccinated 6 and 3 weeks prior to farrowing. Herd recordings included liveborn per litter, stillborn per litter, pre- and postweaning mortality rates as well as the antimicrobial use among weaners. This was compared to herd recordings before vaccination.

Results
Comparative results for mean herd recordings before and after vaccination of sows against PCV2 are shown in Table 1. There was a significant difference (p<0,05) between liveborn per litter, stillborn per litter and weaned piglets per sow per year.

Table 1. Comparison of herd recordings before and after vaccination of sows against PCV2.

<table>
<thead>
<tr>
<th></th>
<th>Before Vaccination</th>
<th>After Vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liveborn per litter</td>
<td>14.85</td>
<td>15.78</td>
</tr>
<tr>
<td>Stillborn per litter</td>
<td>1.95</td>
<td>1.46</td>
</tr>
<tr>
<td>Preweaning mortality</td>
<td>16.0</td>
<td>15.9</td>
</tr>
<tr>
<td>Weaned piglets per sow per year</td>
<td>28.1</td>
<td>30.1</td>
</tr>
<tr>
<td>AVG (grams), weaners</td>
<td>442</td>
<td>461</td>
</tr>
<tr>
<td>Feed Conversion Ratio (FCR)</td>
<td>1.96</td>
<td>1.90</td>
</tr>
<tr>
<td>Postweaning mortality%</td>
<td>2.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Figure 1 represents the antimicrobial use among weaners before and after vaccination of sows against PCV2. In Denmark all antimicrobial used in production animals is registered in a national database named Vetstat. The registration is performed on herd level. Dotted lines represent national and regional average antimicrobial use among weaners. There is a significant difference (p<0,05) between the antimicrobial use before and after vaccination of sows against PCV2. This decline happened without any changes in average daily weight gain, feed conversion ratio or mortality.

Conclusions and Discussion
In this Danish sow herd the main purpose was to reduce stillborn per litter. Vaccination of sows against PCV2 with Circovac® proved successful. Furthermore, when piglets from vaccinated sows were weaned the need for antimicrobial use among weaners was reduced. Although not entirely indicated in the results the actual findings in the herd also point toward more unity and more even sized weaners. The results from this Danish herd therefore indicate a potential advantage in vaccinating sows against PCV2 to gain better preweaning production results as well as reducing antimicrobial use among weaners.

References
3. Stoykov H. et al. (2011) 5th APVS, p. 68