# Field efficacy of Ingelvac CircoFLEX® vaccination following Porcine Circovirus 2 detection in oral fluids by quantitative PCR

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## INTRODUCTION

Numerous publications have shown that the subclinical form of PCV2 is the most prevalent and is capable of causing sizeable production losses.[1] [2]Despite this, signs of infection are not always readily observable and reliable methods to screen for the presence of PCV2 are thus necessary.[2] qPCR of oral fluids for PCV2 is a convenient method to detect the pathogen in herds.[3] Field evidence has suggested that PCV2 vaccination is capable of improving the productive parameters in a herd despite no overt clinical signs of PCV2 infection being seen.[3] The objectives of the study were to determine whether oral fluid samples from pigs without clinical signs of PCV2 disease could be used to diagnose subclinical PCV2 infection and to evaluate if vaccination with Ingelvac CircoFLEX® could improve production parameters and decrease the PCV2 viral titres in oral fluid samples post vaccination.

## MATERIALS AND METHODS

The trial was conducted during the spring of 2015 on a 1,500 sow multi-site unit, positive for M.hyo but free of clinical PCVD. Oral fluid collection was performed from three pens containing about 30 pigs each of age groups 8, 12, 16 and 20 weeks as pre-trial surveillance for PCV2 by quantitative PCR.

In total 5848 pigs from 8 groups (approximately 700 pigs per group) were included at 21 days of age (weaning). Four groups were vaccinated (V) with 1 ml of Ingelvac CircoFLEX® alternating with four control (C) groups who received 1 ml of saline only. Groups were paired (8 groups, 4 pairs) with groups within pairs having similar accommodation. Individual pig weights were obtained at weaning, upon entering the grower pens and prior to slaughter at 20 weeks. Mortality, ADG and FCR was recorded for all groups. Oral fluid collection was again performed from three pens each of 2 V and 2 C groups at 8, 12, 16 and 20 weeks of age to test for PCV2 by quantitative PCR.

Production outcomes were calculated at the group level and compared between groups using the Student's t-test. Individual weights were compared between treatment groups using a linear mixed-effects model, with treatment as the fixed effect and group as the random effect. Oral fluid PCV2 titres were compared between groups at each time point using a linear mixed model, with the Bonferroni adjustment. Analyses were done using Stata 14.1 (StataCorp, College Station, TX) and significance was assessed at $P < 0.05$.

## RESULTS

Pre-trial surveillance indicated that PCV2 was absent at 8 weeks, but present in all older groups in the subclinical range. Production outcomes based on group totals are summarised in table 1. Statistically significant differences were observed in Mortality, ADG and Weight at 128 days.

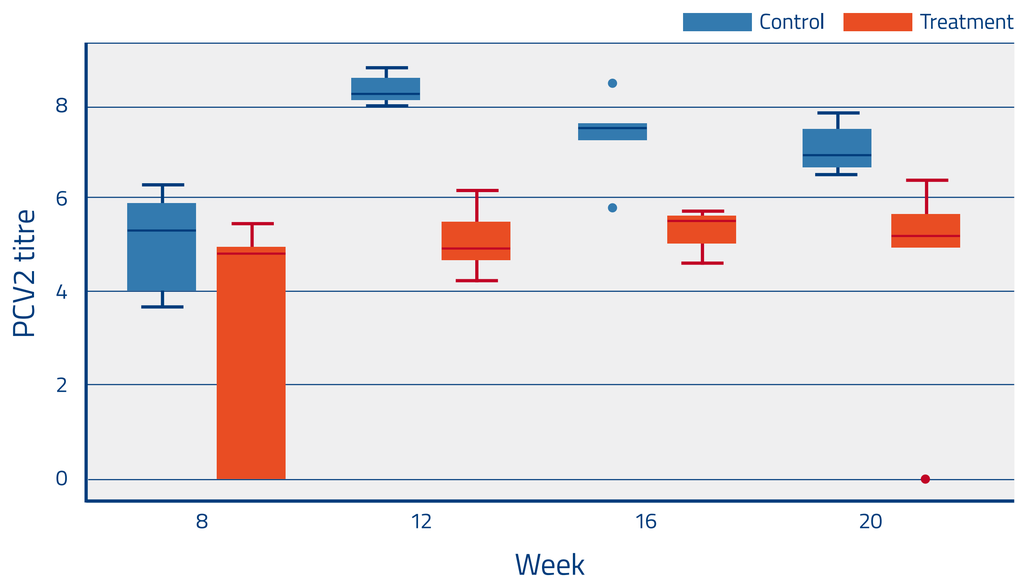
**Table 1: Production outcomes (mean) based on group totals**

| | CircoFLEX® | Control | Difference | P-value |
|---|---|---|---|---|
| Mortality 8 weeks (%) | 1.1 | 2.4 | -1.3 | 0.015 |
| Mortality 8 – 10 weeks (%) | 1 | 2.1 | -1.1 | 0.063 |
| FCR 8 weeks | 1.73 | 1.78 | -0.05 | 0.505 |
| ADG 8 weeks (g) | 553 | 518 | 35 | 0.057 |
| ADG 0 – 128 weeks (g) | 661 | 631 | 30 | 0.015 |
| ADG 28 – 128 weeks (g) | 769 | 732 | 37 | 0.019 |
| ADG 77 – 128 weeks (g) | 820 | 787 | 33 | 0.13 |
| Weight 128 days (kg) | 84.9 | 81.1 | 3.8 | 0.02 |

The results of the linear mixed model indicated that, after adjusting for the clustering effect of pen, vaccination resulted in a 3.84 kg increase in 128 day weight (95 % CI: 2.58 to 5.11 kg;$P < 0.001$).

Oral fluid PCV2 titres obtained post-vaccination were significantly lower at 12 ($P < 0.001$), 16 ($P < 0.033$) and 20 weeks ($P < 0.003$) in the V groups. (Figure 1)

**Figure 1: Oral fluid PCV2 titres assessed by qPCR in V and C pigs**




## DISCUSSION AND CONCLUSION

Under the conditions of this study, pigs vaccinated with 1 ml Inglevac CircoFLEX® benefitted significantly from decreased mortality, increased ADG and increased weights. Oral fluid qPCR analysis proved useful in identifying subclinical PCV2 infection on the farm. There was also a significant decrease in viral shedding in V groups vs. C groups.

## REFERENCES

*1. Lopez,Segales (2015) Pig 333.com accessed 05.01.15*
*2. Prickett et al (2008) Journal of Swine Health and Production 16(2) 86 – 91*
*3. Segales (2012) Virus Research 164:10 – 12*