

Detection of *Mycoplasma hyopneumoniae* in pigs treated with various antibiotics in their feed

Tamiozzo, P. J.¹, Pelliza, B. R.¹, Carranza, A. I.¹, Ambrogi, A.¹

¹Department of Animal Pathology, Faculty of Agriculture and Veterinary Medicine, Universidad Nacional de Rio Cuarto, Ruta 36, km601, Rio Cuarto, Córdoba, Republic of Argentina.

Introduction

Mycoplasma hyopneumoniae (Mhp) is responsible for porcine enzootic pneumonia (PEP), a disease with high morbidity and low mortality found throughout the world.

The use of high-dose antibiotics for short periods has been shown to control a range of porcine diseases including swine dysentery and infections due to *Streptococcus suis*.

This study aimed to determine the presence of Mhp by means of N-PCR from nasal swabs of animals for rearing, treated with three different antibiotics in their feed.

Materials and Methods

A total of 4500 sows were used in the study.

All animals were treated with parenteral antibiotics during the maternity period.

Animals were weaned between 17 and 19 days old, and were subdivided into three groups of 60, called A, B and C.

The trial was conducted over three consecutive weeks. Each group received a different antibiotic in their feed. Group A received 350ppm of tilmicosin, Group B received 50ppm of acetylisovaleryltylosin tartrate and Group C received 100ppm of tiamulin and 400ppm of chlortetracycline.

Swabs were taken from each nostril on day 0 and again on day 14.

DNA was extracted from the samples using the DNAzol kit (Invitrogen®), and the PCR described by Calsamiglia² with some modifications³.

Amplification was undertaken with a final volume of 25µL of a mixture containing: 0.2nM of each primer, 20 pmol of each nucleotide, 1 x buffer, 3mM of MgCl₂ and 1 U of taq polymerase.

The cycle schedule was: 30 cycles at 95°C for 30 seconds, 60°C for 45 seconds and 72°C for 30 seconds, followed by a final extension of 72°C for 5 minutes. The product was run into 1% agar gel with 0.5 µg/ml of ethidium bromide and the observed in a transilluminator.

Results and Discussion

Table 1 presents the positive N-PCR results for all samples taken over the duration of the study.

Table 2 shows all positives over the three weeks.

The use of antibiotics to control and/or eradicate Mhp is an important strategy since in sows, antibiotics act to

reduce shedding of the micro-organism and reduce the carrier state; in suckling animals they act to prevent colonisation and also eliminate the carrier state.^{1,6}

The results show that on day 14, acetylisovaleryltylosin tartrate demonstrated the best results, only 0.55% of pigs were N-PCR-positive..

On day 0, there were no positive samples collected from Groups B and C, this could be due to the medication given before weaning.

The diagnostic technique detects the DNA of Mhp, therefore this may not be viable. Future studies should be performed in order to determine resistance to antibiotics on Mhp isolates, either in Argentina or on the farm where this study was conducted.

Conclusion

From the results obtained, acetylisovaleryltylosin tartrate has demonstrated control/eradication of Mhp.

Table 1 – N-PCR-positive results for all samples and as a percentage for each group over three weeks.

Treatment	Week 1				Week 2				Week 3			
	Day 0		Day 14		Day 0		Day 14		Day 0		Day 14	
	+	%	+	%	+	%	+	%	+	%	+	%
Group A	2/60	3.3	5/60	8.3	0/60	0	0/60	0	0/60	0	0/60	0
Group B	0/60	0	1/60	1.66	0/60	0	0/60	0	0/60	0	0/60	0
Group C	0/60	0	5/60	8.3	0/60	0	2/60	3.3	0/60	0	0/60	0

Table 2 – All positive results (total and as a percentage) over three weeks.

Treatment	Day 0		Day 14	
	Positives	%	Positives	%
Group A	2/180	1.11	5/180	2.77
Group B	0/180	0	1/179	0.55
Group C	0/180	0	7/180	3.88

References:

1. Baekbo, P. et al. 1994. 13th IPVS Congress. Bangkok. Thailand. P 135.
2. Calsamiglia, M., Pijoan, C., Trigo, A. 1999. Applications of a nested polymerase chain reaction assay to detect *Mycoplasma hyopneumoniae* from nasal swabs. J. Vet. Invest. 1;246-251.
3. Smith, W. J., Mortimer, I. 2000. Attempted eradication of *Mycoplasma hyopneumoniae*, *Actinobacillus pleuropneumoniae* and PRRS virus by segregated disease control (SDC) and tilmicosin treatment.
4. Tamiozzo, P., Sernia, C., Pelliza, B., Ambrogi, A. 2006. Estado de colonización de *Mycoplasma hyopneumoniae* de mardes según numero ordinal de partos determinado por Nested-PCR. Memorias del VIII Congreso Nacional de Producción Porcina. V Congreso de Producción Porcina del MERCOSUR. XIV Jornadas de Actualización Porcina. 22, 23 y 24 de Mayo de 2006. Cordoba, Argentina. 294.

