

Haemophilus parasuis (Hp) infections and their control with Tiamutin®

“Take home” messages

- *H. parasuis* is a commonly isolated Gram-negative bacterium classically associated with a disease of young piglets known as Glasser’s disease.
- *Hp* is now considered to be a major bacterial pathogen and source of financial losses due to pneumonia and/or meningitis.
- The widespread occurrence of immuno-suppressive viruses, such as PRRS and the establishment of herds by MEW (medicated early weaning) or SEW (segregated early weaning) are two key factors which have contributed to the emergence of *Hp* as a key pathogen, particularly among co-mingled populations.
- In vitro studies in the UK, USA and Denmark have shown the high activity of Tiamutin (MIC range 1-8mcg/ml) vs. *Haemophilus parasuis*. An extensive US study by Jablonski and others from 1998-2001, reported that 82.4% of 2,680 strains of *Hp* tested were sensitive to tiamulin.
- In the same study only 17% of 1086 strains tested were sensitive to tylosin and only 26% of 859 strains were sensitive to lincomycin.
- A Canadian study on co-mingled pigs in Quebec clearly demonstrated that *Hp* infection could be well controlled with Tiamutin in drinking water at 100ppm thf/litre for 5 consecutive days, commencing 2 days post placement and provided as a ‘welcome’ treatment for incoming piglets.

While 82.4% strains of Hp tested were sensitive to tiamulin only 17% were sensitive to tylosin and only 26% to lincomycin, making Tiamutin the most appropriate medication for Hp infection.

tiamutin[®]
the original – tried, tested, trusted

DEVELOPED EXCLUSIVELY FOR ANIMAL HEALTH • NOT USED IN HUMAN MEDICINE



April 2005 © Novartis Animal Health Inc.
Authors: Ulrich Klein, International Technical Services Manager, Pig Products,
Novartis Animal Health; David Miller, Demafarma Consultancy Ltd.
© Registered trademark of Novartis AG, Basel, Switzerland.
20050014-01



Haemophilus parasuis is a fastidious Gram-negative bacterium existing in 15 known serotypes (-vars).

Classically it was associated with a sporadic, infectious, sometimes fatal, disease of young pigs known as Glasser's disease. This is characterized by polyserositis, polyarthritis and meningitis.

However, consequent upon two primary factors, namely:

- the arrival of PRRS virus and other immuno-suppressive viruses
- the establishment of 'high health' herds by MEW or SEW techniques

the importance of *Hp* has greatly increased.

It is now considered as a major swine bacterial pathogen, particularly in 'high health' herds, which can cause systemic disease of high morbidity and mortality occurring at any stage of production. It is currently identified as one of the most serious problems associated with the mixing of pigs from various herds ("co-mingling") and in these situations the classical polyserositis/arthritis findings are often absent. Clinically sneezing is now associated with *Hp* infections.

Pigs dying from *Hp* infections commonly have extensive thoracic and peritoneal fluid as well as increased joint fluids. *Hp* can produce pneumonia and/or meningitis which can confuse the diagnosis with *M. hyopneumoniae* infection or *S. suis* infection, respectively.

Appropriate use of antimicrobials is considered to be both an important component of the management of *Hp* infection and in vitro and in vivo studies have demonstrated the value of Tiamutin against *Hp* infections.

In vitro studies

The US National Committee for Clinical Laboratory Standards (NCCLS) has defined a breakpoint scheme to classify the sensitivity of *Haemophilus parasuis* strains to tiamulin, as follows:

Table 1: Breakpoints of tiamulin defined by NCCLS (2002)

Fully sensitive	Resistant
< 16 mcg/ml	> 32 mcg/ml

Several studies carried out between 1989 and 2004 have reported a high susceptibility of *Hp* to tiamulin.

- Hannan, P.C.T. and others reported in 1989 on the in vitro sensitivity of 2 strains of *Hp* to tiamulin as 4.0mcg/ml.
- Walter, D. and others at IPVS 2002 reported that 18 *H. parasuis* isolates had an MIC₉₀ to tiamulin of 8mcg/ml.
- Jablonski, E.J. and others (2004) reported that of 2,680 strains of *Hp* examined in USA from 1998-2001. 82.4% were found to be “sensitive” to tiamulin. Only 17% of 1086 *Hp* strains were sensitive to tylosin and only 26% of 859 strains were sensitive to lincomycin.
- Aarestrup, F.M. and others (2004) reported from Denmark that 52 isolates of *H. parasuis* were tested for their susceptibility by MIC determinations to antibiotics. None of the isolates were resistant to tiamulin. Of the 52 isolates tested, 51 were in the MIC range of 1-8mcg/ml, which indicates high susceptibility.

In vivo study

An interesting case report of the possible eradication of *Hp* from co-mingled, multi-sourced SEW piglets with tiamulin in water, was made at the IPVS Congress 1998 by Moore, C. A. and Sanford, S.E.

On a SEW, multi-site system in Quebec, Canada, *Actinobacillus pleuropneumoniae* (serotype 7) (*App*) infection was diagnosed at post-mortem after a sudden increase in mortality in finishing pigs.

Pigs on the multi-site, multi-source SEW system were co-mingled from 9 sow herds into "all in/all out" nursery barns. Weaning took place at 16-18 days of age. Historically pigs in this system would start to sneeze approx. 2 weeks after placement in the nurseries.

A diagnostic investigation to identify which of the 9 supplier herds were contributing *App*-infected pigs to the nurseries consisted of:

- nasal swabs and serological samples collected from 5, 4 ½ week old piglets from each of the source herds, two weeks after placement in one of the AI/AO, off site nurseries.
- nasal swabs for bacteriological culture
- serum samples for testing for *App* serotype 7 antibodies.

Haemophilus parasuis was isolated from a number of pigs from each of the source herds; all isolates were untypable. Serological test results showed that *App* serotype 7 was present in 4 of the 9 sow herds.

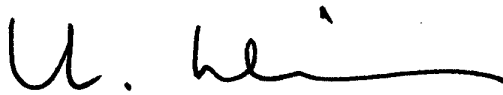
Tiamutin medication at 100mg thf/litre drinking water for 5 consecutive days, commencing 2 days post placement, was introduced for all future incoming piglets (a "welcome" treatment).

Results

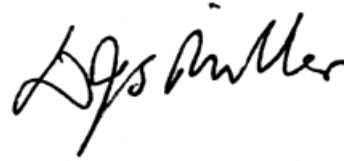
- Sneezing stopped abruptly in the nursery pigs and did not reappear in the 8 months immediately following the commencement of Tiamutin therapy.
- Finishing pig mortality returned to normal as the AI/AO finisher buildings were refilled with Tiamutin medicated pigs.
- 2 months after Tiamutin therapy was started nasal swabs were again cultured from co-mingled nursery piglets two weeks after placement.
- *H parasuis* was not isolated from any of the 45 piglets sampled.

The authors commented that:

“The discovery and then apparent elimination of *H. parasuis* was an unexpected but welcome surprise”.



Dr Ulrich Klein
International Technical Services
Manager, Pig Products



Dr David Miller
Demafarma Consultancy Ltd

Further information on the Tiamutin® (tiamulin) range of products is available from the Pig Products Manager at Novartis Animal Health operations in over 50 countries worldwide.

References

1. Aarestrup F.M. et al. (2004). *Veterinary Microbiology* 101, p. 143-146
2. Hannan P.C.T. (1989). *Research in Veterinary Science*. 46, p. 202-211
3. Jablonski E.A. and Roberts J.D. (2004). *Proc. Am. Assoc. Swine Vet., Des Moines, Iowa, USA*. p. 69-73
4. Moore C.A. and Sanford S.E. (1998). *Proc. 15th IPVS Congress, Birmingham, UK*. Vol. 2, p. 166
5. National Committee for Clinical Laboratory Standards (2002). 2nd ed. NCCLS, M31-A2
6. Walter D. et al. (2002). *Proc. 17th IPVS Congress, Ames, Iowa, USA*. Vol.2, p. 80