



## Rationale for the use of “Tiamutin<sup>®</sup>” Injectable vs *Actinobacillus pleuropneumoniae* (App) infection – clinical experience

### “Take home” messages

- Feed and water consumption are markedly depressed in pleuropneumonia outbreaks, thus therapy by injection is necessary.
- Many isolates of *App* are now resistant to tetracyclines and penicillin.
- Tiamutin<sup>®</sup> Injectable is an appropriate therapy for pleuropneumonia at a dose of 15.0 mg tiamulin hydrogen fumarate (THF) per kg bodyweight I/M for two consecutive days, since:-
  - a) it concentrates in lung tissues following I/M injection and persists at therapeutic levels for 24 hours
  - b) reports from artificial and field infection studies indicate successful control of mortality and reversal of average daily live weight gain depression in pigs affected with pleuropneumonia which were medicated with Tiamutin<sup>®</sup> Injectable.

***Under field conditions Tiamutin<sup>®</sup> Injectable has proved to be a highly effective therapy against acute pneumonia associated with App***

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**tiamutin<sup>®</sup>**  
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Tiamutin injectable has been demonstrated to be efficacious against *App* infections in clinical artificial infection and field studies.

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An early artificial infection study was reported at the IPVS in 1988 in Rio de Janeiro, Brazil by Schultz, G. L. and others.

A 16 day study was conducted to evaluate the effect of tiamulin base administered I/M to pigs artificially infected with *App*. The dose administered was equivalent to 16.2 mg thf/kg body weight for approximately four consecutive days.

48 healthy Landrace x Yorkshire Cross pigs from a source with no prior history of *App* infection were individually identified and divided into eight pens each with six pigs. The pigs were weighed and blood sampled for serological evaluation of antibodies to *App*.

All pigs were infected with a 10 hour culture of *App* serotype 5 isolate 1725, 1ml of inoculum being instilled into each nostril. Medication with Tiamutin was given when clinical signs of pneumonia were present subsequent to the induced infection and was continued once daily by I/M injection until rectal temperatures were normal for two consecutive days or until they had received injections for four consecutive days, whichever occurred first.

### Conclusion

The results are summarized below:-

Parameter	Injected non-medicated group	Tiamutin injected group
1) Mortality	16%	0%
2) Lung lesion score	17.2%	10.0%
3) Re-isolation of <i>App</i>	75%	25%
4) Average daily feed intake (days 0-16)	522g	1.014kg
5) Average daily gain (days 0-16)	104.5g	422.7g
6) Feed conversion efficiency (days 0-16)	5.0	2.39

In this early study the reduction in mortality from 16% to 0% was particularly striking.

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Barfod and others also reported at the IPVS in Bologna, Italy in 1996, on the efficacy of Tiamutin Injectable against an experimentally induced *App* infection (serotypes 4 and 7) in pigs.

A standardized aerosol exposure model was used to simulate the naturally occurring disease.

Caesarean section derived piglets were reared gnotobiotically for three weeks and then adapted for a further five to six weeks to a pig house environment. The study was performed in two separate trials, one involving *App* serotype 4 and one involving serotype 7.

In both trials the pigs were randomized into two groups, Groups 1 and 2.

**Group 1** (Positive controls) were infected and treated with penethamate, a pro-drug of penicillin G, at 20mg/kg body weight per day intramuscularly.

**Group 2** were infected and treated with tiamulin base equivalent to 20mg tiamulin hydrogen fumarate/kg bodyweight intramuscularly.

Both groups were treated when both fever and then the clinical signs of pneumonia were present, and were injected daily until the signs of pneumonia disappeared. Pigs in the Tiamutin group were injected an average of 1.3 x per pig and those in the positive control group 1.5 x per pig.

The *App* organisms used to infect the pigs (serotypes 4 and 7) had a MIC of 8.0 mcg/ml to tiamulin and 0.125 and 4.0 mcg/ml to penethamate, by the agar dilution method.

The infection was induced by exposing pigs in groups of four for ten minutes, in an aerosol chamber to *App*. 18 ml of inoculum diluted to a concentration of  $10^6$  cfu/ml was used.

The pigs were weighed before and at the end of the study. They were sacrificed and examined for lung lesions 34 days post-infection in the *App* serotype 4 trial and at 49 days in the *App* serotype 7 trial.

A comparison of the efficacy of the two treatments was made on the basis of the extent of lung lesions, number of days of coughing, body temperature, daily weight gain and the extent of pleurisy.



Conclusion

The disease produced in this trial was typical of naturally occurring pleuropneumonia and it was demonstrated that clinical signs can be eliminated by only one or two I/M injections of Tiamutin at a dose of 20mg thf/kg bodyweight.

At the IPVS in The Hague, Netherlands in 1992 Edwards and Pott reported on the use of Tiamutin Injectable versus field infections with *Actinobacillus pleuropneumoniae*.

The study was carried out to determine the efficacy under field conditions of one I/M injection for two consecutive days at a dose of 15mg thf/kg bodyweight.

Farms in the UK with a history of acute clinical pneumonia associated with confirmed *App* infection were chosen for the study. The MIC's of the *App* to tiamulin from the three farms were as follows:-

Farm	App. MIC (mcg / ml)
Farm 1	4.0
Farm 2	8.0
Farm 3	4.0

Groups of pigs affected with acute pneumonia were randomized into two groups according to severity of symptoms, as follows:

- Group 1            “Tiamutin<sup>®</sup>” injection 15mg thf/kg body weight for two consecutive days
- Group 2            Positive control: oxytetracycline 20mg/kg bodyweight

Respiration, coughing, bodily condition and appearance were monitored and recorded on the first day of treatment (day 0) and on days 3 and 7. Body weight was recorded on days 0, 7 and 14.

On days 3 and 7 post-injection there was a significant improvement in the character of respiration in the Tiamutin group (p < 0.005).



Significant improvements in coughing, body condition and appearance were also reported.

### Conclusion

The authors considered that a dose level of 15 thf per kg bodyweight administered I/M for two consecutive days was a highly effective therapy against pneumonia associated with *App* under field conditions.

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**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.**