

EVALUATION OF THE EFFICACY OF TIAMULIN HYDROGEN FUMARATE,  
WHEN INCLUDED IN THE FEED AT LEVELS OF 20 AND 30 PPM,  
IN THE IMPROVEMENT OF WEIGHT GAIN & FEED CONVERSION EFFICIENCY IN THE PRESENCE OF ENZOOTIC PNEUMONIA.

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### Introduction

Enzootic pneumonia (EP) is caused by *Mycoplasma hyopneumoniae* (Goodwin, 1965, Maré & Switzer 1965). Clinical signs are normally seen in the fattening stage of production where affected pigs frequently cough, and in extreme cases deaths may result, but usually the major effects of the disease are to depress growth rate (ADG) & feed conversion efficiency (FCE).

Tiamulin has been shown to be extremely active in-vitro against the causative organism *M. hyopneumoniae* (Goodwin, 1979), and it was the purpose of this programme of trials to evaluate the efficacy of tiamulin when included in feed at 20 & 30 ppm in mitigating the effects of the disease.

### Methods

Four trials were carried out in the United Kingdom, involving 440 pigs. Three farms were used, each with a history of severe EP problems, with between 80-93% of the pigs showing typical lung lesions when examined at slaughter. *M. hyopneumoniae* were demonstrated in lung touch preparations by Dr. P. Whittlestone of Cambridge University. There was no history of swine dysentery or atrophic rhinitis on these farms. The trials lasted for 8 weeks during the fattening stage of the pig's life i.e. between 30-70 Kgs liveweight. The pigs were weighed at the start of the trial and randomly divided into their treatment groups on an equal number, sex and pen weight basis. They were weighed 4 weeks later (Part 1) and again after a further 4 weeks (Part 2). The amount of feed given to each pen was recorded. After the trial the pigs were slaughtered and their lungs examined and scored depending on the extent of the lesions.

**Farm 1:** Two consecutive trials were carried out, each with 6 pens of 15 pigs, giving in all 4 replicates of the 3 treatment groups. Each group was fed a standard ration which contained tiamulin (Dynamutalin Feed Premix, E.R. Squibb & Sons Ltd) at a level of 20 & 30 ppm, and a non-medicated feed as a negative control. All feeds contained zinc bacitracin and copper as growth promoters.

**Farm 2:** This trial involved 3 pens of 20 male pigs & 3 pens of 17 female pigs giving a further 3 replicates of the treatments examined which were tiamulin at 20 & 30 ppm against a negative control. All feeds contained tylosin and copper as growth promoters.

**Farm 3:** This trial involved 6 pens of 25 male pigs giving a further 3 replicates of tiamulin at 30 ppm against negative controls. All feeds contained copper as a growth promoter.

### Results

The results of the 3 trials carried out on farms 1 & 2 are summarised in Tables 1 & 2.

TABLE 1: Growth Rate (3 trials, 6 replicates, 291 pigs)

Drug Level (ppm)	Part 1		Part 2		Overall	
	ADG (g)	Impvnt (%)	ADG (g)	Impvnt (%)	ADG (g)	Impvnt (%)
O Negative Control	796		613		704	
20 Tiamulin	827*	(3.9)	622	(1.5)	724	(2.8)
30 Tiamulin	795	(-0.1)	671*	(9.5)	734*	(4.3)

\* P<0.05

TABLE 2: Feed Conversion Efficiency

Drug Level (ppm)	Part 1		Part 2		Overall	
	FCE	Impvnt (%)	FCE	Impvnt (%)	FCE	Impvnt (%)
O Negative Control	2.845		3.372		3.074	
20 Tiamulin	2.730°	(4.0)	3.541	(-5.0)	3.077	(-0.1)
30 Tiamulin	2.789	(2.0)	3.109*	(7.8)	2.919*	(5.0)

° P=just>0.05 \* P<0.05

The results of all 4 trials, comparing 30 ppm tiamulin and negative controls are summarised in Tables 3 & 4.

TABLE 3: Growth Rate (4 trials, 9 replicates, 344 pigs)

Drug Level (ppm)	Part 1		Part 2		Overall	
	ADG (g)	Impvnt (%)	ADG (g)	Impvnt (%)	ADG (g)	Impvnt (%)
O Negative Control	716		702		708	
30 Tiamulin	727	(1.5)	752***	(6.6)	741**	(4.7)

\*\* P<0.02

\*\*\* P<0.01

TABLE 4: Feed Conversion Efficiency

Drug Level (ppm)	Part 1		Part 2		Overall	
	FCE	Impvnt (%)	FCE	Impvnt (%)	FCE	Impvnt (%)
O Negative Control	2.864		3.112		2.953	
30 Tiamulin	2.783	(2.8)	2.909**	(6.5)	2.815**	(4.7)

\*\* P<0.02

In farm 1 the incidence of pneumonia was 89%, in farm 2, 80% and in farm 3, 93%.

### Discussion

The results of these studies show that tiamulin, when included in feed at 30 ppm, significantly improved the weight gains and F.C.E. of pigs affected with enzootic pneumonia. It therefore helped to reduce the deleterious effects of the disease by maintaining growth performance. These improvements were over and above those achieved by the growth promoters such as copper, zinc bacitracin & tylosin standardly included in the diets, and at a stage in the fattening period when expected performance benefits from such additives are usually small. At the same level of 30 ppm, tiamulin has also been proven to be effective in preventing swine dysentery (Taylor, 1980).

Tiamulin at 20 ppm gave significant improvements in weight gains & F.C.E. in the first part of the trials but did not, in the second when the level of pneumonia had increased. It must be remembered that the farms had severe pneumonia problems with between 80-93% of the pigs affected with the disease.

Neither level of tiamulin appeared to reduce the incidence of enzootic pneumonia lesions.

### Summary

Four field trials carried out in the UK, involving 440 pigs demonstrated that tiamulin at 30 ppm in the feed, significantly improved the weight gains & F.C.E. of pigs by 6.6% and 6.5% respectively when they were severely affected with enzootic pneumonia, (80-93% incidence).

### References

- Goodwin, R.F.W. et al. (1965) Veterinary Record, 77, 1247-1249.
- Goodwin, R.F.W. (1979) Veterinary Record, 104, 194-195.
- Maré, C.J. & Switzer, W.P. (1965) Veterinary Medicine, and Small Animal Clinician, 60, 841-846.
- Taylor, D.J. (1980) Veterinary Record, 106, 526-528.