

EUROPEAN FIELD STUDIES SHOW EFFECTIVENESS OF ECONOR® IN CONTROL OF SWINE DYSENTERY

INTRODUCTION Several field trials in four countries have been conducted to evaluate the effectiveness of Econor® (valnemulin) in the prevention and treatment of swine dysentery, which is caused by *Brachyspira hyodysenteriae* (*Serpulina hyodysenteriae*), a spirochaetal bacterium. The trials also considered the performance of treated pigs.

United Kingdom

In the United Kingdom, four trials involving 144 pigs on two farms tested the efficacy of Econor against swine dysentery when administered at the recommended rate of 75 ppm in feed for 7 days.¹

Both farms were commercial operations that bred and fattened swine. Both had a history of severe clinical disease due to swine dysentery. On Farm A, efforts to control the disease with medication had been tried but failed.

Farm A weaned at 3 to 4 weeks of age into weaner bungalows; swine dysentery appeared about 3 weeks later and worsened when pigs were moved again in a few weeks at a weight of about 35 kg. On Farm B, pigs were weaned at about 6 weeks of age and disease appeared even while piglets were still with their dams.

Two trials were conducted at each farm and were initiated when acute dysentery occurred in groups of pigs so severely that some of the animals required tiamulin injections.

Pigs were assigned to pairs matched for the presence of clinical signs and bodyweight. One pig from each pair received Econor in the feed and the other received unmedicated feed. At the end of the first week, the treatments were

reversed: Medicated pigs received unmedicated feed and the unmedicated pigs received Econor.

Results

Pigs that received Econor were effectively treated for swine dysentery in only 7 days.

- > By the end of the trial at 15 days, spirochaete shedding was almost completely suppressed. In the unmedicated pigs, swine dysentery increased or remained the same.
- > In all four trials, average daily gain was better among Econor-treated pigs during the first week of each trial. In Trial 1 on Farm A, for instance, the average daily gain of treated pigs was 80% better than in untreated pigs.
- > Even on Farm B, where the achieved drug dosage was less than optimal and poor hygiene and intercurrent enteric disease complicated swine dysentery, the average daily gain and feed conversion ratio were better in Econor-treated pigs than in nonmedicated animals.

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KEY POINTS

- > Field trials in four countries have demonstrated that Econor Premix is effective in the prevention and treatment of swine dysentery.
- > Pigs with swine dysentery that received Econor demonstrated improved performance parameters, such as average daily gain and feed conversion ratio.
- > In Polish trials that considered safety, no adverse drug reactions were attributed to Econor.

> Sick pigs not treated with tiamulin still managed to consume enough feed to benefit from Econor.

Researchers' observations: "Valnemulin given in feed proved effective in the control of acute and severe swine dysentery and largely eliminated the shedding of spirochetes. Applied in timely fashion at the correct dosage, it can be effective even without ancillary treatment." (See Table 1.)

Table 1
Weight Gain and Food Conversion Ratio During First Week of Trial

		No. of animals	Valnemulin dose (mg/kg)	Average daily gain (g)	FCR
FARM A	Trial 1 Med	20	3.8	829	1.50
	Control	20	—	541	1.90
	Trial 2 Med	19	2.9	201	7.50
	Control	19	—	-189	—
Farm B	Trial 1 Med	16	3.1	765	1.50
	Control	16	—	589	1.74
	Trial 2 Med	17	2.3	373	1.50
	Control	17	—	254	1.84

Germany

The increasing emergence of tiamulin-resistant strains of *B. hyodysenteriae* prompted German investigators to study the effectiveness of Econor against swine dysentery.²

The investigators first conducted sensitivity trials, which showed dimetridazole and lincomycin to be 16 and 1,000 times, respectively, less effective than Econor.

Furthermore, researchers noted that sensitivity to tiamulin was about 3.8 times less than for Econor with some isolates, but the same for other strains. Econor and tiamulin were both considered highly effective.

The investigators then studied Econor's effectiveness against acute and subclinical swine dysentery.

Acute Swine Dysentery Trial

The German investigators next considered the therapeutic efficacy of Econor against acute swine dysentery on a farm with 650 fattening pigs and an outbreak of acute dysentery.

The study was conducted on a farm with 650 fattening pigs and an outbreak of acute dysentery. One group of pigs consisting of 15 animals received 3 mg Econor/kg bodyweight. Pigs in Group B, which was similar to Group A in total body weight, received a placebo premix.

After 7 days, the medication trial was switched. Group A pigs received a placebo and Group B was treated with Econor. Pigs were re-evaluated on day 14 of the trial.

Results

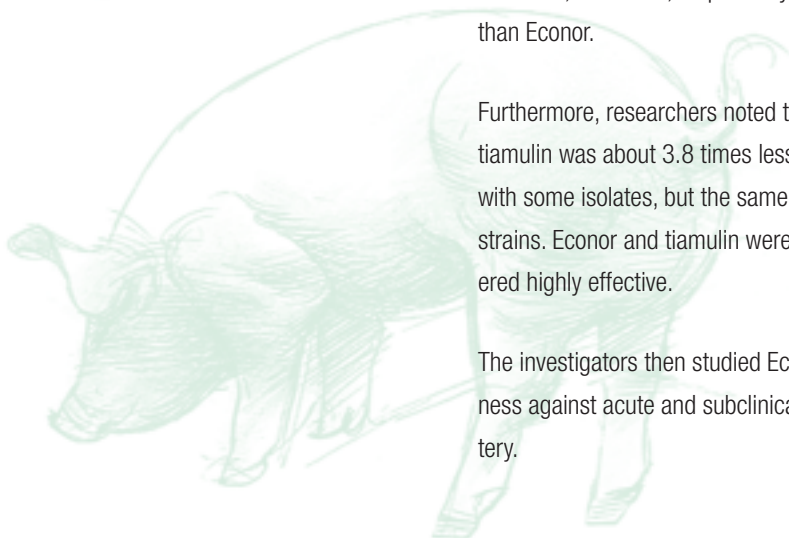
> By day 7, body weights were significantly higher in the Econor-treated group. Pigs in both groups weighed an average of 65 kg at the start of the trial but, by day 7, treated pigs weighed 75 kg and controls weighed 70 kg.

> Econor-treated pigs showed an average daily gain of 1,428 g, compared to 696 in the untreated group.

> Following the switch in medication — when Group A (Econor) pigs received a placebo and Group B (placebo) received Econor — the average daily gain was 1,219 g in the newly-medicated Group B, which was significantly higher than the 676 g in Group A.

Chronic Swine Dysentery Trial

To evaluate the efficacy of Econor for treating pigs with chronic swine dysentery, one group of 47 pigs was treated for 21 days with 1.0 mg Econor/kg bodyweight another group of 48 pigs received a placebo and served as controls. Animals were weighed on days 11 and 21 of the trial.



“...Econor applied in timely fashion at the correct dosage”

Results

> Following the third day of administration, no pigs in the Econor group showed any evidence of swine dysentery. In the control group, symptoms of swine dysentery could be seen periodically.

> The weight of the treated pigs increased from 36 kg to nearly 51 kg in 21 days — more than a 40% gain. In contrast, the weight of untreated pigs increased from 31 kg to 42 kg over the same period, only a 35.5% gain.

Researchers' observations: Econor was highly effective against *B. hyodysenteriae*. In addition, the "...therapeutic use of Econor not only causes a total loss of symptoms during the medication, but also induces significantly higher weight gains." The results of the second trial confirms the efficacy of Econor in preventing clinical swine dysentery in herds with subclinical dysentery. (See Table 2.)

Poland

Econor was tested on two large farrow-to-finish farms in Poland that had a history of swine dysentery.³ This study, conducted with pigs ranging in age from 4 to 16 weeks, examined longer-term treatment with Econor and sought to evaluate both the efficacy and safety of the antibiotic. Econor was administered to 4-week-old pigs for 10 days, to 8-week old pigs for 7 days and to 12- and 16-week old pigs for 5 days.

On Farm Z, 420 pigs received Econor at the recommended rate of 75 ppm. There were two control groups: One received tiamulin at the rate of 200 ppm and the other received no medication. Injectable enrofloxacin or amoxicillin were administered intramuscularly to anorexic pigs.

On Farm L, 417 pigs received Econor at the rate of 75 ppm and 403 received no treatment. Some of the pigs also received amoxicillin in drinking

water, which was given during a portion of the trial to control respiratory disease. Control animals received tiamulin (125ppm) and oxytetracycline (400ppm) via the feed.

Table 2
Weight Gains in Pigs With
Chronic Dysentery

	Group C	Group D
Pigs per group	47	48
Medication	Econor*	Placebo
Body weight day 0 (kg)	36.07*	31.28
Body weight day 11 (kg)	43.68*	37.38
Average daily gain day 0-11 (g)	683*	555
Body Weight day 21 (kg)	50.69*	42.66
Average daily gain day 11-21 (g)	731*	527
Average daily gain day 0-21 (g)	706*	512

Results

> No adverse drug reactions attributable to Econor were observed during the trials.

> On Farm Z, only one pig (0.31%) treated with Econor had to be individually treated for swine dysentery, compared to 18 in the tiamulin group (5.62%) and 116 (36.2%) in the controls.

> Average daily gain in pigs on Farm Z receiving Econor during the growing and fattening period was 635 g (+9.1%), compared to 607 g (+4.1%) for the tiamulin group and 582 g for controls.

> On Farm Z, only 2 (0.6%) of the Econor-treated pigs either died or were rejected due to swine dysentery, versus 11 (3.4%) in the tiamulin group and 23 (7.2%) of controls.

> Econor-treated pigs on Farm L also had better weight gain and averaged 21 fewer days to market than controls.

Researchers' observations: "...it seems justified to conclude that on pig farms, treatment with Econor reduced significantly the number of pigs

Table 3
Animal Performance During the Production Phase in Farm L

	Control	Econor
No. of animals	403	417
Initial weight (kg)	8.48	9.32
Body weight at sale (kg)	103.46	97.93
Daily gain (g)	409 (100%)	419 (102.4%)
Interval from birth to sale (days)	232	211

with clinical symptoms of swine dysentery. The treatment with Econor applied in the recommended doses is safe and effective.” (See Table 3.)

> Pigs treated with a placebo shed more spirochaetes and showed significantly ($p < 0.01$) more blood and mucus in their feces than pigs receiving Econor.

> All pigs in the trials treated with Econor showed an average daily gain of 849 g, compared to 721 for controls — a 17.8% improvement.

> The feed conversion ratio for treated pigs was 2.24, 11.1% improvement over the 2.52 ratio in controls.

Denmark

Two trials were conducted on typical Danish farms with a history of *B. hyodysenteriae*.⁴

In each trial, half the pigs received Econor in the feed at the rate of 25 ppm for 4 weeks and the other group received a placebo. All pigs, which weighed approximately 45 kg at the start of the trials, were examined routinely throughout the study. Those with signs of severe dysentery were treated individually with tiamulin injections.

Researchers' observations: “It is clear from these two trials that Econor Premix effectively prevents the clinical signs and weight loss occurring with swine dysentery in typical Danish farms.” (See Table 4.)

Table 4
Combined Field Trial Results

	Untreated controls	Econor 25ppm treated	Improvement (%)
Average daily gain (g)	721	849	17.8
FCE	2.52	2.24	11.1
Pigs with S.D. (%)	32.4	0	100
Pigs with Spirochaetes (%)	24.5	0	100

SUMMARY Field trials conducted in four European countries demonstrate that Econor is highly effective in the prevention and treatment of swine dysentery. Pigs with swine dysentery that were treated with Econor also had significantly improved performance.

For more information on any study summarized here, please contact your local Novartis Animal Health representative or Dr. Ulrich Klein at Ulrich.klein@ah.novartis.com.

Results

> In Trial 1, 21 of the 54 pigs (39%) that received a placebo developed swine dysentery, but none of the pigs treated with Econor showed any symptoms.

> In Trial 2, 11 of 48 pigs (23%) receiving a placebo developed swine dysentery. Once again, none of the pigs treated with Econor showed symptoms.

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