

TREATMENT OF AVIAN INTESTINAL SPIROCHAETOSIS CAUSED BY BRACHYSPIRA PILOSICOLI WITH TIAMULIN (TIAMUTIN – NOVARTIS) – A FIELD EXPERIENCE

David Burch, Octagon Services Ltd, Old Windsor, United Kingdom | Martin Valks, Novartis Animal Health, Basel, Switzerland | Roberta Alvarez, Novartis Animal Health, Basel, Switzerland

The disease

Intestinal spirochaetes have been observed primarily in the caeca and recta of layers and breeders around the world and have been mainly associated with wet droppings (see pictures 1 & 2), poor egg production and weak chicks. In some cases, spirochaetes were found without adverse effects on production.

Picture 1: Fawn watery droppings



Picture 2: Brown soft droppings

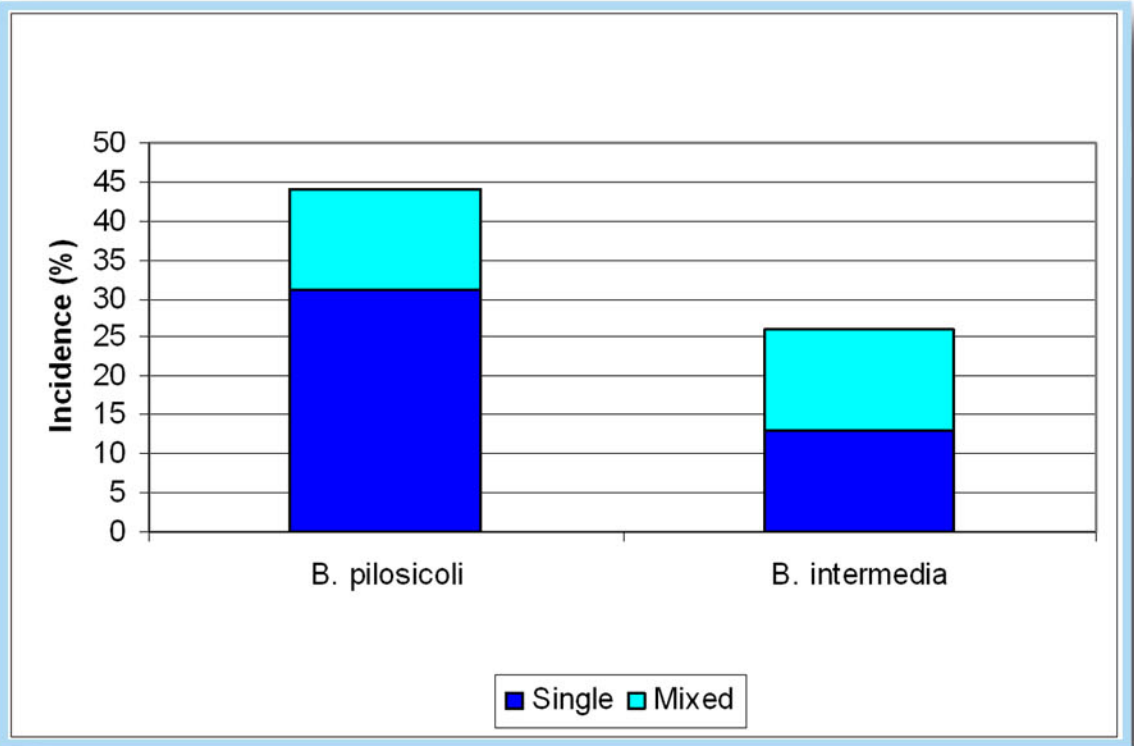


In the nineties spirochaetes were renamed and reclassified and work, mainly in Australia, demonstrated that they can be divided into two major groups, those which are considered **pathogenic**, *Brachyspira pilosicoli*, *B. intermedia* and *B. alvinipulli* and those that appear **non-pathogenic**, *B. innocens* and *B. murdochii*.

Further survey work in Australia (Stephens and Hampson, 1999) showed that 68% of layer flocks and 43% of breeder flocks were infected with spirochaetes. Of those flocks investigated, 44% were infected with *B. pilosicoli*, and 25% with *B. intermedia* either as a single or mixed infection (See graph 1).

B. pilosicoli and *B. intermedia* are associated with a mild to moderate typhlitis causing soft to liquid brown faeces, pasty vents, faecal staining of eggs, delayed onset of laying and reduced egg production by between 5-10%. *B. alvinipulli* is also associated with a mild form of the disease in N. America (Swayne, 2003). Spirochaetes can persistently colonise caeca.

Graph 1. Comparative incidence of *B. pilosicoli* and *B. intermedia* in layer and breeder flocks



A field experience

A commercial laying farm, with three caged flocks of approximately 12000 birds each, was reported to be showing reduced egg production and poor performance over an 18 month period. Serological investigation did not reveal any major viral or mycoplasmal problems and there was no response to chlortetracycline administered via the feed at 600ppm on regular 7-8 week intervals. The level of soft faeces was higher than normal but not widespread. Birds were sent for autopsy and *B. pilosicoli* was isolated from the caeca and confirmed by biochemical means.

Following consultation, it was decided to treat the birds with tiamulin at 12.5mg/kg bodyweight for 3 days via the drinking water. The daily dose in pigs for *B. hyodysenteriae*, a related organism, was 8.8 mg/kg bodyweight for 3-5 days. The birds showed consistent and steady improvements in faecal consistency, appetite, egg production and mortality.

The results of a previously infected flock, which had not been treated with tiamulin, were compared with a flock where tiamulin was given at 25 and 45 weeks of age (See table 1 and graph 4). There was an overall 10.3% improvement in egg production on a hen housed (HH) to 72 week of age basis. Mortality fell from 13.8% to 5.3%. Bodyweights were similar in this case, but feed consumption/day was increased in the treated flock by 8.2%.

Overall tiamulin was highly effective in treating *B. pilosicoli* in laying hens and preventing the development of the disease. Economically, tiamulin gave an additional return of **28.6 eggs/HH** and after deducting extra feed and medication costs, the benefit could be valued at **0.81 Euros/HH**, in comparison with infected birds (See table 2).

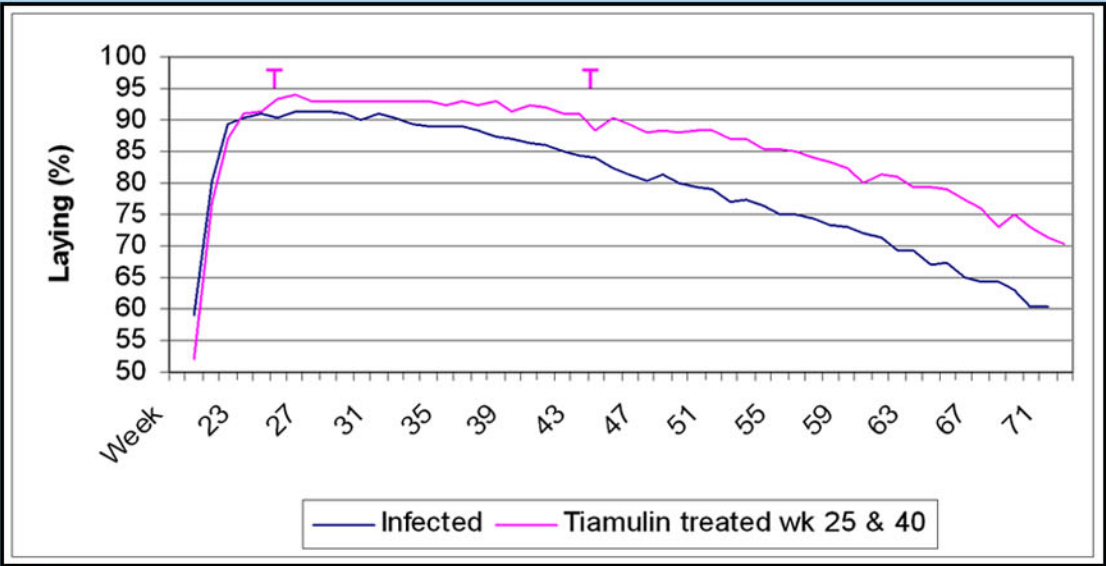
Table 1. Comparative production data for an infected untreated flock and tiamulin-treated flock at 25 and 45 weeks of age

	Infected flock	Tiamulin-treated flock	Improvement (%)
No of hens housed	12402	12156	-
Breed	Lohmann	Goldline	-
Eggs/HH week 72	291.75	320.33	10.26
Total egg weight/HH (kg)	18.59	20.4	9.7
Ave egg weight (g)	63.71	63.68	-0.03
Feed consumption/day (g)	111.285	120.432	8.2
Ave bodyweight (kg)	1.935	1.9	-1.8
Mortality (%)	13.84	5.25	8.59
Extra eggs/HH	-	28.58	-

Table 2. Economic comparison of an infected untreated flock and tiamulin-treated flock at 25 and 45 weeks of age

	Infected flock	Tiamulin-treated flock
Number of layers	10,000	10,000
Total feed (tonnes)	405.077	438.372
Feed cost (172.8 €/tonne) (€)	69,997	75,751
Tiamulin (2x3x12.5mg/kgx1.8kg) (g)	-	1350
Tiamulin cost (€0.547/g) (€)	-	739
No of eggs (million)	2.9053	3.2033
Value of eggs (0.049€/egg) (€)	142,243	156,834
Difference: (Value-Costs) (€)	72,246	80,344
Flock value difference (€)	-	8098
Difference/HH (€)	-	0.81

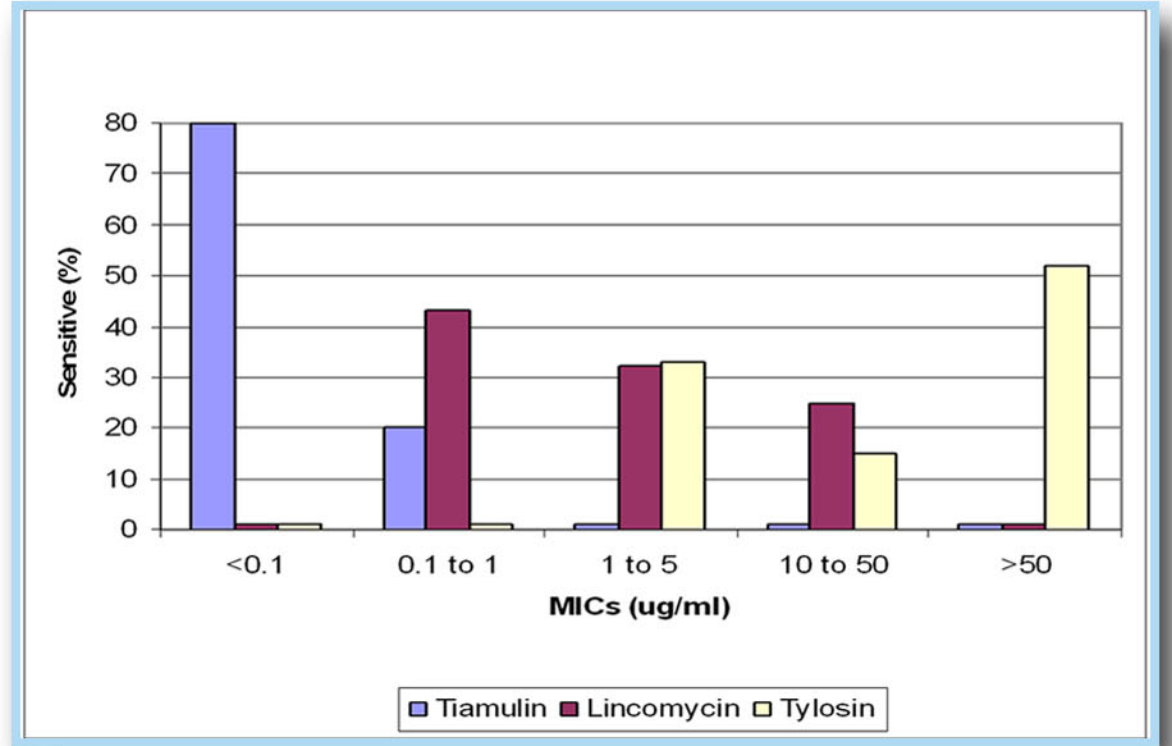
Graph 4. Comparative laying curves of *B. pilosicoli* infected and tiamulin-treated flocks



B. pilosicoli - antimicrobial susceptibility

B. pilosicoli has been shown to be highly susceptible to the antibiotic tiamulin in vitro (Hampson and Stephens, 2002), intermediately to lincomycin and tylosin, but there is distinct resistance to over 50% of tylosin isolates (See graph 2).

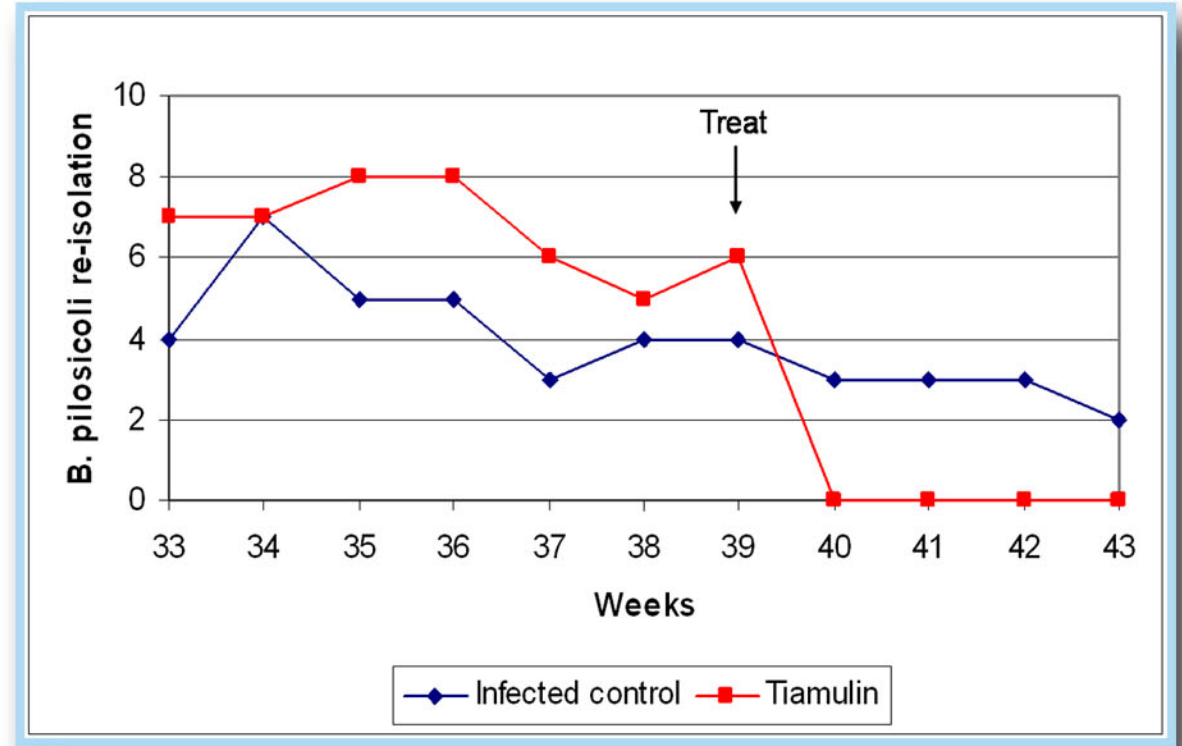
Graph 2. Susceptibility of *B. pilosicoli* to various antimicrobials



Artificial infection study

Tiamulin was shown to be highly effective in treating an artificial infection with *B. pilosicoli* in broiler breeders (Stephens and Hampson, 2002). Birds were infected at 32 weeks of age and treated at 39 weeks with tiamulin administered at 25mg/kg bodyweight directly into the crop for 5 days (See graph 3).

Graph 3. Efficacy of tiamulin on the shedding of *B. pilosicoli* post treatment at 25mg/kg bodyweight for 5 days



Conclusions

- 1 *B. pilosicoli* is potentially a serious, chronic pathogen in laying birds and should be considered as part of the differential diagnosis when there is increased wet faeces and poor egg production.
- 2 Faecal contact is a major factor in the spread of the infection and may be more likely to occur in free-range and barn-reared flocks. Fly control is important, especially in caged flocks.
- 3 Tiamulin is very active in vitro against *B. pilosicoli*.
- 4 Artificial infection studies and field experience shows that tiamulin is particularly effective in treating this condition and gives an excellent cost/benefit result.