Proceedings of the

4-7 July **2000** – Valencia Spain

These proceedings were printed as a special issue of WORLD RABBIT SCIENCE, the journal of the World Rabbit Science Association, Volume 8, supplement 1

ISSN reference of this on line version is 2308-1910
(ISSN for all the on-line versions of the proceedings of the successive World Rabbit Congresses)

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Volume B, pages 345-349

EFFECT OF ZINC BACITRACIN ON EPIZOOTIC RABBIT ENTEROCOLITIS.

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ABSTRACT

Zinc bacitracin is commonly used in rabbit farms to prevent mortality at fattening in cases of Epizootic Rabbit Enterocolitis. Using zinc bacitracin at a rate of 100 ppm as from weaning -in a rabbit farm affected by Epizootic Rabbit Enterocolitis. since the autumn of 1997- made it possible to reduce mortality from 21.4 % (control group) to 3.6 % and significantly improved weight at sale (+91g).

INTRODUCTION

Epizootic Rabbit Enterocolitis (ERE).was first reported in France and other European countries in 1997. Virtually no regions were spared and death rates up to 50 - 70 % were recorded at fattening. Mortality causes were studied by several teams from the INRA, the AFSSA, veterinary schools and private laboratories. Research made it possible to reproduce the disease experimentally and develop a study model. But, although the viral lead was favoured, the pathogenic agent has not always been highlighted (Licois & Coudert, 1999).
After the initial acute phase, a number of measures were taken on field to master the disease : setting up of a sanitary barrier, development of all in-all out management programs, generalisation of certain antibiotic supplies in the drinking water or the feed. Despite these steps, an upsurge of ERE cases occurred in certain regions from the fall of 1999, leading to a 10-20 % mortality at fattening. More than ever has the disease been up to date as for epidemiological studies, research on the causal agent or means for struggle in the farms.
Zinc bacitracin is commonly used in rabbit breeding to prevent mortality at fattening in ERE cases. This molecule is prescribed in farms as from weaning, at the rate of 100 ppm in the feed, with a 7-day withdrawal period before slaughtering, and as long as its Temporary Authorisation for Use remains available. The aim of the present trial was to show the efficacy of bacitracin as a sole supplementation in a rabbit farm affected by ERE since the autumn of 1997.

MATERIALS AND METHODS

The trial was carried out at the experimental centre GLON SANDERS in Sourches, France (Veaujours Farm). The breeder flock of Hyplus strain was artificially inseminated 10 days after dropping. Weaning took place at 37 days of age. Fattening took place in collective cages of 7 rabbits each, corresponding to a density of 14.2 rabbits per square meter.
The experimental design (Table 1)
Treatment 1 (Control), consisted in feeding Formula No. 8022, without bacitracin, during the whole length of fattening. Treatment 2 (Experimental) consisted in feeding Formula No.

8006, the same as 8022 but supplemented with 100 ppm bacitracin, from 37 to 63 days of age, and then Formula No. 8022 (Control feed) from 63 to 70 days.
Rabbits were weighted at weaning and assigned to one weight block as far as 4 blocks were constituted with the same number of rabbits in each block. Then, weight blocks were assigned to fattening treatment as far as we have the same repartition of weight block in each treatment.
The rabbits were slaughtered at 70 days of age.

Table 1: Experimental design

Treatment	1	2
Formula No. (37-63 days)	8022	8006
Formula No. (63-70 days), without bacitracin	8022	8022
Number of rabbits	168	168
Number of cages	24	24

Recordings
Rabbits were weighted at weaning (37 days), at 49 days and at the end of the trial (70 days). The feed was weighted too during the trial.
Statistics
Analysis of variance with two factors was carried out on the trial :
- Treatment at fattening (1-2),
- Weight blocks (1-4): '1'<1090 g < '2' < 1148 g < '3' < 1196 g < '4'
Mortality was assessed with the khi 2 test (fattening treatment effect).

Chemical analyses of the feed (Table 2)
Chemical analyses were consistent with the values formulated for proteins and water content.
The experimental feed used in Treatment 2 (Formula No. 8006) was supplemented with 100 ppm zinc bacitracin.

Table 2: Feed analyses results

Treatment	**1**		**2**	
Formula No.	8022		8006	
Bacitracin (ppm)	**0**		**100**	
(% of feed)	Formulated	Analyzed	Formulated	Analyzed
H_2O	12.0	11.8	12.0	11.2
Crude Protein	16.4	15.9	16.4	16.1

RESULTS AND DISCUSSIONS

Table 3: Overall results

TREATMENT	**1** (0 ppm)	**2** (100 ppm)	Sign.
Number of rabbits	168	168	
Mortality 37-70 days (%)	21.4	3.6	***
Weight at 37 days	1136	1149	NS
Weight at 70 days	2623	2714	*
ADG 37-70 days (g/day)	45.0	47.4	*
Technical Intake (g/day) 37-70 days	155.7	162.2	*
TI Index 37-70 days	3.47	3.42	NS

NS : non significant ; * : p<0.05 ; ** : p<0.01 ; *** :p<0.001

Mortality
Table 4 provides the mortality and morbidity results per treatment, and specifies death causes.

Obviously, the differences in mortality and morbidity observed between the two treatments, to the detriment of Treatment 1 (Control), were due to ERE and related digestive problems.

Table 4: Mortality (%) from 37 to 70 days		
Treatment	**1**	**2**
Bacitracin (ppm)	0	100
Death causes		
Diarrhea	5	5
ERE	19	0
Paresis	3	0
Unknown	2	0
Non autopsied	7	1
Total deaths	36	6
% mortality	21.4	3.6
% sick animals (non dead)	17.8	4.8
% morbidity	39.2	8.4

Table 5 provides mortality per period and according to weight blocks.
With Treatment 1 (Control), the second part of the fattening period (49-70 days of age) was marked by a high increase in mortality whereas no increase was observed with Treatment 2. The difference between the two treatments is highly significant. This results in the same significance over the entire duration of the trial (37-70 days).
Overall, mortality was 3.6 % with zinc bacitracin versus 21.4 % without zinc bacitracin. In the absence of zinc bacitracin, the main death cause was ERE whereas no ERE cases were observed in the presence of zinc bacitracin.

Table 5: Mortality (%) per period			
Treatment	1	2	Sign. X^2
Bacitracin (ppm)	0	100	
37-49 days	1.2	1.8	NS
49-70 days	20.2	1.8	***
37-70 days	21.4	3.6	***

Zootechnical performances

Results are shown in Table 6. Zinc bacitracin had a positive effect on performances .
Records show :
- an increase of 91 g, which is significant and represents an additional 3.4 % of weight sold.
- an effect on daily intake with an average additional 6.5 g/rabbit/day, which represents a 328-gram increase over the period per rabbit sold (+ 6%),
- no effect on the Technical Intake Index. This index does not take intakes of dead animals into account.

Table 6: zootechnical performances (g)

Treatment	**1**	**2**	RSD	P Baci.	P block
Bacitracin (ppm)	0	100			
Weight					
- 37 days	1136	1149	40	NS	***
- 49 days	1767	1801	84	p=0.1	***
- 70 days	2623	2714	137	*	***
Technical Intake					
- 37-49 days	1584	1619	128	NS	***
- 49-70 days	5137	3732	284	*	*
- 37-70 days	5023	5351	335	*	**
Technical Daily Intake					
- 37-49 days	132.0	134.9	10.6	NS	***
- 49-70 days	169.2	177.7	13.5	*	*
- 37-70 days	155.7	162.2	10.2	*	**
Technical Intake Index					
- 37-49 days	2.53	2.49	0.26	NS	NS
- 49-70 days	4.18	4.10	0.32	NS	**
- 37-70 days	3.47	3.42	0.16	NS	**

* : p=0.05 ** : p=0.01 *** : p=0.001
NS: non significant RSD : Residual Standard Deviation

CONCLUSION

The presence of zinc bacitracin markedly diminished mortality during the trial : -17.8 points of mortality; weight at sale was significantly improved.
The use of this molecule in procedures aimed at controlling ERE is concluded to be absolutely justified.

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