

RABBIT HEALTH CONTROL BY MANAGEMENT

Finzi A.*, Macchioni P., Negretti P.

Rabbit Unconventional Rearing Experimental Centre, Department of Animal Production, University of Tuscia,
01100 Viterbo, Italy

*Corresponding author: finzi@unitus.it

ABSTRACT

Cumulative mortality by Epizootic Rabbit Enteropathy was recorded from 1999 by the fattening section of the Experimental Centre in Viterbo and by a commercial unit. Both units utilized the same alternative open air system of a group of farmers that adopted a not pharmacological control of pathologies. When the enteropathy appeared, the commercial unit had to adopt a prophylactic antibiotic treatment (Tiamuline 60 ppm and Apramycin ppm) for four weeks after weaning. The rabbits were treated until 2003 when the evolution of the not pharmacological prophylactic strategy became effective. Results were compared for 5 years, showing how the mortality after weaning could be progressively reduced from 43.4% to 7.0% (no pharmacological treatment) and from 16.8% (pharmacological prophylaxis) to 8.5% when the pharmacological treatment was suspended. This was obtained, after successive trials, reducing the density in the fattening cages from 4 to 3 subjects, stamping out the rabbits at the first suspect of not perfect health and isolating the other animals of the same cage. A sequence of 88 consecutive days with no mortality was recorded in 2007 when a mean of about 150 rabbits was present in the open air fattening area of the Centre. To explain these results the mortality from the third week after weaning was compared in the cages where in the first two weeks there were cases suspected of enteropathy and in the cages where this was not observed. The results confirmed that the direct or indirect (drinkers and feeders) contact with rabbits showing the first symptoms of enteropathy is related with the spreading of the sickness (29.1% in comparison with 0.7% of the control; $P < 0.001$). The many empiric trials performed from 1999 show that the alternative open air keeping units can be maintained in a very good healthy state without any pharmacological control of pathologies, enteropathy included. Among the many attempts to get this result the most effective were the reduction of the density of the animals in the fattening cages, the immediate stamping out of each suspected rabbits and the isolation of the other subjects present in the same cage. Observing these rules it is proved that global mortality can be maintained under 10% in the growing period.

Key words: Rabbit, Health, Management.

INTRODUCTION

In the specific context of a model of alternative open-air keeping already described (Finzi, 1987; Finzi *et al.*, 1992; 2000; 2001) and now slowly spreading in the Province of Viterbo (Finzi, 2004; Finzi and Macchioni, 2004) pharmacological treatments were excluded according to an agreement with a cooperative of farmers adopting the keeping system. In the unit of the experimental Centre, as well as in the small commercial units, pathologies have been maintained at a low level for many years, tanks to a strict hygienic control. But, more recently, mortality after weaning severely increased as an effect of Epizootic Rabbit Enteropathy.

The mortality by the Centre was regularly recorded since 1999 and could be compared for five years to the ones of a commercial unit. The latter was compelled, for economical reason, to use for three years a low level of antibiotic control in the four weeks after weaning. Intermediate results have been published (Macchioni *et al.*, 2000; Mariani *et al.*, 2002) but it seems now possible to assert some definitive conclusions.

MATERIALS AND METHODS

Mortality after weaning, caused by enteropathy, was recorded by the experimental keeping of the Centre and by a private one for a period of five years (from 1999 to 2003 included). Both the open-air units were characterized by a housing system based, for each doe, on an underground cell connected by a tube to an external cage. In this system, not direct contact among the animals is possible. Fattening cages were hanged under the simple roof of a no-walls structure. The whole system was previously described (De Lazzer and Finzi, 1992; Finzi *et al.*, 1992; 2000). Fattening cages measured 0.30 m², and housed four rabbits each until 2002 and only three later on.

In no phase of reproductive or productive cycle the animals were pharmacologically treated, not even with anticoccidials nor vaccinated against myxomatosis or hemorrhagic disease. In 1999 the dead animals by enteropathy were removed from the cages. Later on, according to the results of successive trials, the animals were removed from the cage: at beginning when sick, then at the first symptoms and, at the end, when appeared the first signs of not perfect health being less reactive and tending to assumed a typical crooked up attitude. These animals were immediately stamped out and the rabbits present in the same cage were transferred to single cages in an isolation area. The lower density established after 2002 allowed to isolate only two animals instead of three when one subject was stamped out. The control of diseases was only managerial, exploiting the favourable conditions of microbial dispersion in the open air, the lack of direct contact in the reproduction section, careful cleaning of cages (the movable slatted floors were frequently substituted with clean ones to be washed and disinfected in a special area) and, at the end, by immediate stamping out of suspected animals.

After the first strike of the epizootic enteropathy, the private unit was compelled until 2001 to use antibiotics at lower doses (Tiamuline 60 ppm and Apramycin 70 mg/kg) for four weeks after weaning while by the Centre it was maintained the strict no-treatment rule. Weekly mortality by enteropathy began to be recorded from 1999. The trends were reported as cumulative curves, easily showing in what phase of the growing period mortality affected the rabbits. This system was adopted also by French authors (Duperray, 2003; Lalanne, 2003; Boisot *et al.*, 2005a) to illustrate different trials aimed to reduce the mortality from enteropathy.

To try to explain the excellent practical results obtained in 2006, mortalities from the third week after weaning were compared in the cages where, in the first two weeks, there were cases suspected of enteropathy, wherever it happened and in the cages where this was not observed. The cages were 249 and 85 respectively. The hypothesis was that if a subject gets infected, probabilities increase that also the other animals present in the cage get infected by direct contact or contaminated drinkers and feeders, thus explaining why the keeping units can be maintained in a very good healthy state by immediate elimination of the suspected subjects and isolating the rabbits presents in the same cage. These results were compared by a χ^2 test (SPSS 9.0, 1999).

RESULTS AND DISCUSSION

In Figure 1 is shown the cumulative mortality by enteropathy in the Centre and in the commercial unit. In 1999, when only the dead animals were removed, mortality was very high by the Centre (43.4%), while antibiotics succeeded to get a partial control of the pathology in the commercial unit (16.8%). Nevertheless in the latter, the mortality was observed to increase after the fourth week when the antibiotic treatment was suspended. This result was in agreement with Coudert and Licois (2005) which observed that a treatment with bacitracin produced a delay of several days before the apparition of the disease. The death of older animals (Figure 2) had a negative economical effect in relationship with the lower mortality.

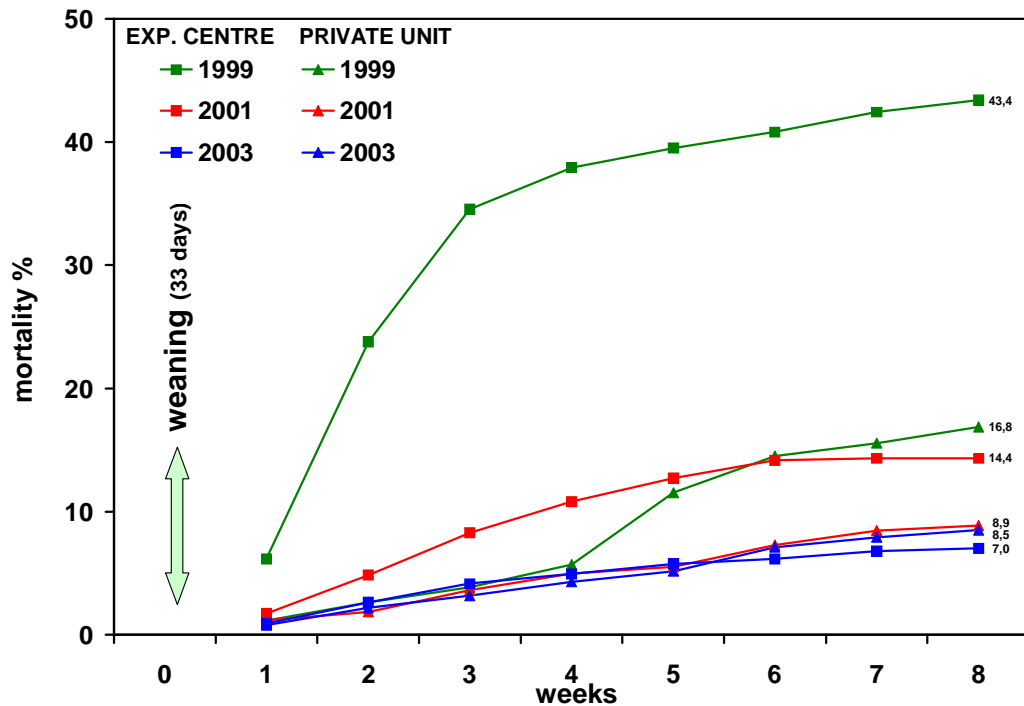


Figure 1: Cumulative mortality (mean of the monthly records) by the Experimental Centre and by the private unit, the latter using the reduced of the antibiotics dosage until 2001

After two years, when the animals were stamped out when sick, mortality decreased to about 14.4% by the Centre and 8.9% by the commercial unit. From the economic point of view the results were not very different since in the commercial unit the rabbits were lost at higher live weight so that the owner decided to suspend the antibiotics treatment.

In 2003, when also the private unit had suspended the antibiotic treatment, mortality was represented practically only by stamped out rabbits and the total amount decreased to very satisfactory values (7.0% and 8.5% by the Centre and by the private unit respectively). Since in the mean time the industrial units of the area, by the general and constant use of antibiotics reduced the mortality to a level never lower than 18%, being frequently higher than 20%, the obtained results were attributed to the favourable keeping conditions (open air, with high microbial dilutions in the environment) supported by stamping out at the first suspect of not perfect health, combined with the immediate isolation of the rabbits of the same cage when also the density was reduced from four to three subjects.

In the cages where no cases suspected of enteropathy were observed in the first two weeks after weaning, 5 rabbits dead or were eliminated in the following fattening period over a total of 747 (0.67%) subjects (Figure 3). On the contrary, when a previous morbidity was observed and the suspected animals were stamped out in the first two weeks after weaning, the rabbits from the same cages, which were isolated, showed a mortality or were eliminated in the following period in number of 39 over a total of 134 (29.10%). The difference between the two groups was significant ($P < 0.001$).

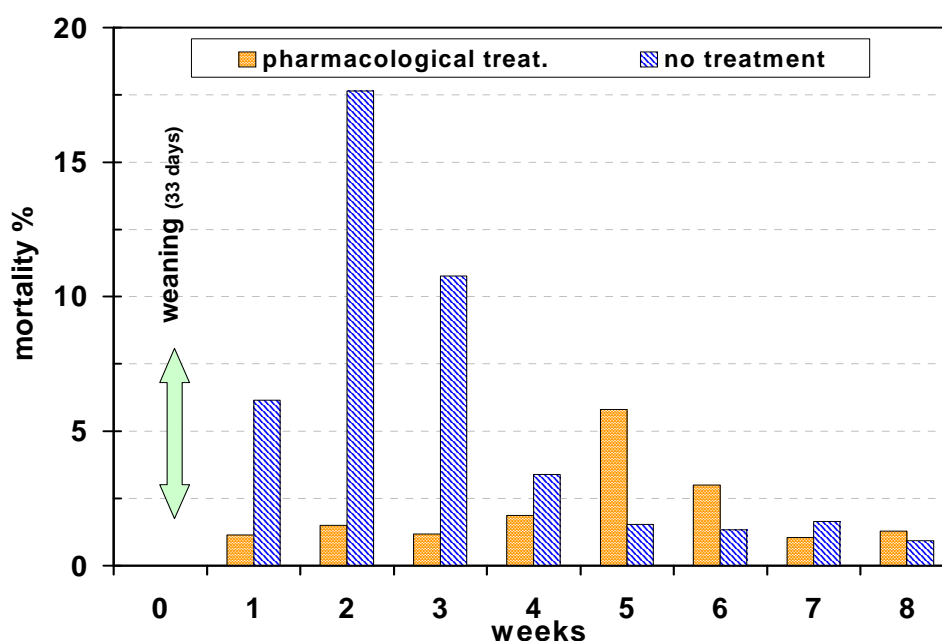


Figure 2: Weekly percent mortality in pharmacologically treated and not treated growing rabbits (1999)

Results confirmed the hypothesis that, if a subject gets infected, probabilities increase that also the other animals present in the same cage become sick by direct contact or contaminated drinkers and feeders. The result is in strong agreement with Boisot *et al.* (2005b), which concluded that sick animals represent a source of contamination even more important than the artificial inoculation tested in their trial. This explains why the keeping units can be maintained in a very good healthy state by immediate elimination of the suspected subjects and isolating the rabbits present in the same cage. Mortalities well lower than 10% in the fattening period were indicated also by other commercial producers in the alternative system adopting the open air and the stamping out rule of the cooperative.

Table 1: Mortality following the 2nd week after weaning. Comparison between the rabbits which had or had not a previous contact with sick subjects

	No previous contact	After contact
Number of cages	249	85
Number of rabbits	747	134
Number of dead rabbits	5	39
Mortality %	0.67% (A)	29.10% (B)

*different capital letters correspond to a significant difference ($P < 0.001$)

Though it is impossible to demonstrate, an increasing of a genetically based resistance can also be supposed according to the results of Garreau *et al.* (2005), considering that the genetically more sensible animals could have been eliminated in the first years thanks to the high mortality allowed by the lacking of treatments with antibiotics. This, as the immediate stamping out, could have prevented that the more sensible animals transmit the unfavourable genetic traits to their offspring.

From an epidemiological point of view, the presence of the pathology is still constant in all the commercial and alternative units in Italy. This evidence should suggest the name of *rabbit enzootic enteropathy* at least in Italy.

CONCLUSIONS

The many attempts to get a not pharmacological control of the enteropathy in rabbits raised in the open air unconventional system showed a progressive reduction of mortality. Among these attempts the most effective was the reduction of density in the fattening area, the immediate stamping out of

each suspected animal and the isolation of the other subjects present in the same cage. Observing these rules global mortality can be maintained under the 10% in the fattening period.

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