

RESISTANCE PARAMETERS TO GASTROINTESTINAL PARASITOSIS IN ZERASCA, A TUSCANY INDIGENOUS BREED

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1. INTRODUCTION

Zerasca is an indigenous sheep breed (Fig. I) in endangered status, but carries out a primary position in the safeguard of Tuscany biodiversity, typical production improvement and agricultural district protection. The study took on natural rangelands around Zeri in the north-west part of Tuscany at an altitude of 600-1200 m. Rough countries with self-shown sloping pastures typify that area. The Zerasca positive resistance to adverse climate conditions underlines a strong linkage with the whole environment, even if local shepherds' habit is to treat animals twice a year with antiparasitarian drugs, mainly in consequence of the presumed loss of productions. The aim of this work is to provide information on natural nematode infections in Zerasca breed, focusing on genetic parameters of faecal egg counts (FECs), often highly correlated with the whole worm burden. Furthermore, haematocrit (PCV) was measured as a useful indicator if blood sucking parasites are dominant species.



Fig. I. Example of Zerasca breed.

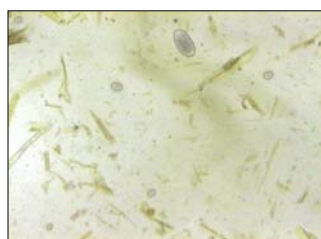


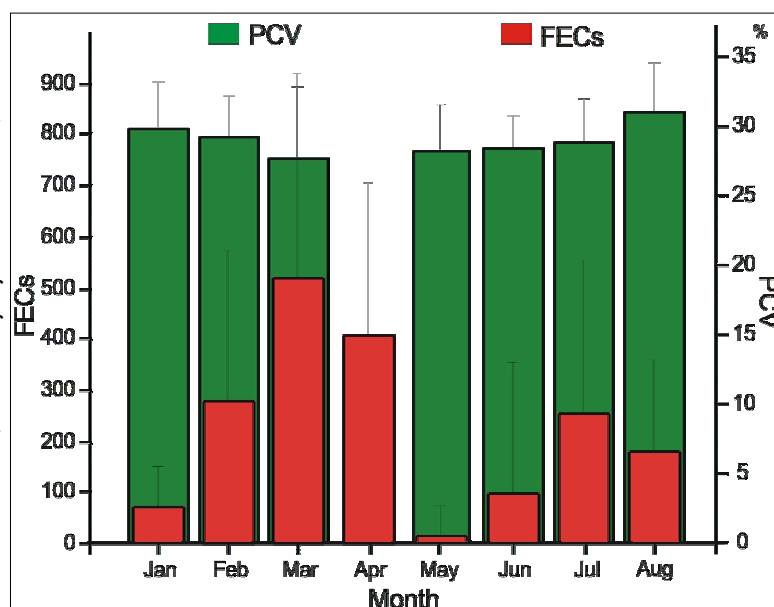
Fig. II. *Strongylus* and *Coccidia* eggs.

2. MATERIALS AND METHODS

The study was conducted from January to August 2004 on forty eight sheeps of a flock, chosen by relative relationships. Anthelmintic treatment was administered in November '03 and in May '04 and animals were monthly sampled for coprological and haematological examinations: FECs were performed according to the modified McMaster method (Fig. II) and PCV was determined by capillary microhaematocrit analysis. FECs were transformed [$\log(\text{FEC}+25)$] to normalise the variance. Repeatability of monthly FECs and PCV were estimated by Pearson's correlations, while the average repeatability between the monthly values was tested with the method of intra-correlation-class. Heritability coefficient was evaluated using daughter-mother regression.

3. RESULTS AND DISCUSSION

PCV mean was about 29.4, while the average of FECs was 289 (post-drench period not included). Apart from the firm decrease of FECs after treatments (Graph. I), we observed a notable reduction between the 3rd (mean 517) and the 4th samples (mean 407) and among the 7th (mean 254) and the 8th (mean 179), suggesting a natural progress to adaptation at nematode burden of the animals. Interestingly, 63 % of blood samples was included in the physiological range of PCV and the same percentage of faeces samples showed an acceptable parasite burden (≤ 300 eggs per gram), pointing out the feasibility of useful breeding programs for gastrointestinal nematode resistance. Besides, FECs was significantly negative correlated with PCV ($r = -0.22$; $P < 0.05$), probably caused by the presence of blood-sucking worm species. FECs' heritability and repeatability coefficients were respectively 0.33 and 0.36, estimated remarkable values for indigenous sheep breeds. Moreover, considerable correlations between FECs' monthly values were observed, implying to focus faeces' samples by the second month after anthelmintic treatment for an effective genetic selection.



Graph. I. Trend of FECs and PCV.

4. CONCLUSIONS

Our results confirm the feasibility of antihelmintics' reduction in Zerasca breed by a close genetic selection for FECs and PCV, with positive repercussions on drugs' residual in the soil and pharmacological resistance: actually, allopathic therapy do not suggest the effectiveness of antihelmintic treatments as applied by farmers. Treatments limited to the non-resistant subjects move significant economical and ecological implications in breeding management. Further studies are required to examine the possible relationships between resistance and resilience, through production traits' analysis.

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