E. G. Martins,* † ‡ **1** P. Oliveira,* † B. M.Oliveira,§ D. Mendonça,*† and J. Niza-Ribeiro*†

*Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto,4050 Porto, Portugal
† EPIUnit,Instituto de Saúde Pública da Universidade do Porto, 4050 Porto, Portugal
‡ Department of Veterinary Medicine, Escola Universitária Vasco da Gama,3020 Coimbra,
Portugal
§Centrode Investigação em Tecnologias e Serviços de Saúde

Association of paratuberculosis sero-status with milk production and somatic cell counts across 5 lactations, using multilevel mixed models, in dairy cows

The aim ofthis work was to investigate associations between individual cow Mycobacterium avium ssp. paratuberculosis (MAP) seropositivity, 305-dcorrected milk production, and somatic cell count during 5 lactations lifespan in Portuguese dairy herds using multilevel mixed models. We used MAP serum ELISA (Idexx MAP Ac, Idexx Laboratories Inc., Westbrook, ME) results (n = 23,960) from all the 20,221 adult cows present in 329 farms and corresponding 47,586 lactation records from the National Dairy Improvement Association. Cows and farms were classified as positive or negative. Multilevel mixed models were used to investigate the association of cow MAP status with variation in milk production and somatic cell count. Cow MAP status, farm status, and lactation number were considered as independent variables. A quadratic function of lactation number was used to mimic the effect of lactation order on milk production. The models considered 3 levels: measurement occasion (level 1) within cow (level 2) and cow within farm (level 3). Four final models were produced, including all herds and cows, to address the effect of farm status (models 1 and 2) or the effect of cow status (models 3 and 4) on the outcome variables. Our results show that MAP status affects milk production. Losses are detectable from third lactation onward. During the first 5 lactations, positive cows accumulated an average loss of 1,284.8 kg of milk when compared with the negative cows. We also observed that somatic cell counts were higher in positive cows and a positive interaction occurs between cow status and lactation number, suggesting a positive association between MAP infection and increased somatic cell counts. Our results are in line with previous studies, suggesting a possible positive relation between cow milk production and susceptibility to MAP infection.

Keywords
paratuberculosis, milk production, somatic cell count, multilevel mixed model

ISBN: 978-1-917892-30-8

Biography

Elisabete Martins is CEO and senior associate at Montalvo Pecuária e Turismo, Veterinarian at Archer Daniels Midland Company, Business Partner at Greenside of See Hostel and Assistant Professor at Escola Universitária Vascoda Gama (EUVG). She graduatedin Veterinary Medicineat the Universidade de Trás-Os-Montes e Alto-Douro in 1998. After an internship in Universitat Autonoma de Barcelona (Spain) and Semexand International LivestockManagement School

(Canada) she became a practitioner in Bovine and Swine production and clinical medicine. This experience was recognized with the invitation for the position as assistant professor at the Escola Universitária Vasco da Gama (EUVG) (2008 and onwards), for the curricular units of Production Animals' Clinics and Herd Health and Production Medicine, of the final curricular year of the Master's Degree in Veterinary Medicine.

Elisabete holds a PhD in Veterinary Sciences (2021), by the Instituto de Ciências Biomédicas Abel Salazar – University of Oporto (ICBAS-UP) and teaches at EUVG.

ISBN: 978-1-917892-30-8