

# Exploring the boundaries of animal, veterinary and biomedical sciences

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# ABSTRACT BOOK

## The use of *Cistus ladanifer* condensed tannin extract as additive to improve the soybean meal protein efficiency in lamb diets

Dentinho MTP<sup>1,2</sup>, Paulos K<sup>1</sup>, Francisco A<sup>1,2</sup>, Belo AT<sup>1</sup>, Jerónimo E<sup>3,4</sup>, Almeida J<sup>1</sup>, Santos-Silva J<sup>1,2</sup>, Bessa RJB<sup>2,5</sup>

1. Instituto Nacional de Investigação Agrária e Veterinária (INIAV), Fonte Boa, 2005-048 Santarém, Portugal; 2. Centro Investigação Interdisciplinar em Sanidade Animal (CIISA), Avenida Universidade Técnica, 1300-477 Lisboa, Portugal; 3. Centro de Biotecnologia Agrícola e Agro-Alimentar do Alentejo (CEBAL), 7801-908 Beja, Portugal 4. Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM), Universidade de Évora, 7000 Évora, Portugal 5. Faculdade de Medicina Veterinária, Universidade Lisboa, Avenida Universidade Técnica, 1300-477 Lisboa, Portugal

*Cistus ladanifer* L. is a shrub distributed around the Mediterranean basin and very abundant on the central and southern regions of Portugal. In recent decades, due to the land abandonment and recurrent fire events, the area occupied by *C.ladanifer* has expanded considerably leading to loss of biodiversity and further increase in forest fire risk due to the high flammability of this resinous shrub. The use of this natural resource in animal nutrition may be a feasible solution that can contribute for the autonomy and sustainability of these agricultural and forestry areas considered critical by the low profitability and fire hazards. *Cistus ladanifer* is rich in phenolic compounds, mainly flavonoids and condensed tannins (CT) in leaves and stems. Condensed tannins complex with protein and this ability has been extensively studied for application in ruminant nutrition to improve the feed protein efficiency, namely in protecting the dietary protein from excessive microbial degradation in the rumen. Our aim was to study the use of *C.ladanifer* CT as additive to improve the soybean protein efficiency in lamb diets. A metabolic trial was performed with three rumen-cannulated rams in a 3 × 3 Latin square design to evaluate the effect of the *C.ladanifer* CT on apparent digestibility, N balance, rumen microbial N supply, ruminal fermentation characteristics, *in sacco* rumen degradability and *in vitro* intestinal digestibility of soybean meal. Soybean meal (SBM) was treated with 0, 15 and 30 g/kg of *C.ladanifer* CT. The treatment with 15 g/kg of CT was the most favorable reducing the protein rumen degradability and increasing the amount of protein absorbed in the small intestine, without compromising the digestibility of the diet. Thus, a productive trial was conducted to evaluate the effect of SBM treated with 15 g/kg on DM of *C.ladanifer* CT on lamb's growth, carcass and meat quality. Twenty four Merino Branco lambs were assigned to three dietary treatments based on hay and concentrate (15/85 (w/w)) and fed at 4% live weight. Concentrates were formulated to contain: 16% of crude protein (CP) with untreated SBM (Control); 12% of CP with untreated SBM (Restricted protein (RP)); 12% of CP with SBM treated with 15 g/kg on DM of *C.ladanifer* CT (RPT). With CT inclusion, a positive response on lamb's growth and feed conversion ratio were obtained and carcass traits and meat quality were not affected by all treatments. Results suggest that *C.ladanifer* CT extract has potential to be used as feed additive to increase the digestive efficiency of SBM protein in lamb diets. Thus, the protein content of diets can be reduced without compromising lamb performances and consequently decrease feed costs.

**Keywords:** *Cistus ladanifer*, condensed tannins, protein, soybean meal, lambs.

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