Legume Grains as Alternative to Soybean in the Diet of Dairy Ewes - Abstract

Sotiria Vouraki [1], Vasiliki Papanikolopoulou [1], Eleni M. Abraham [2], Zoi Parissi [2] and Georgios Arsenos [1]

[1] *School of Veterinary Medicine, Faculty of Health Sciences, Aristotle University Campus, Thessaloniki, 54124, Greece*
[2] *School of Forestry and Natural Development, Aristotle University Campus, Thessaloniki, 54124, Greece*

Summary

Legumes are feedstuffs with high nutritional value and can be used to substitute or replace soybean in ruminant nutrition. The latter could contribute both to economic efficiency and environmental sustainability. However, the notion is that legumes contain antinutritional and toxic factors, which might compromise animal performance. The objective here was to assess whether replacing soybean with a mixture of legume grains (lupin, pea, vetch, faba bean) could affect milk production and body condition score (BCS) of intensively reared dairy ewes. A total of 40 Chios dairy ewes at the third month of first to fifth lactation period were randomly selected from a purebred flock. Ewes were allocated in two (n=20) groups (control C and treatment T) balanced for level of milk production after weaning and number of lactation period. Ewes were fed a pelleted concentrate feed together with Lucerne Hay and wheat straw (1.5, 1.5 and 0.3 kg/animal/day, respectively). Group C received a conventional concentrate feed with soybean. Group T received a concentrate feed of equal energy and protein content (1 UFL/kg dry matter and 158.5 g/kg dry matter, respectively) in which soybean had been replaced with 500 grams of the aforementioned mixture of legumes. Chemical composition and antinutritional compounds of legumes were assessed. Data collection was performed every 15 days for a 60-day period (a total of five measurements). Feed refusals from each group were weighted to calculate total and average individual feed intake. The BCS of each ewe was assessed by palpation of the dorsal lumbar region. Milk yield of individual ewes was recorded electronically; energy corrected milk yield was calculated. Individual milk samples were also collected to assess chemical composition (fat, protein, lactose, solids-non-fat; SNF). Data analysis was performed with mixed linear models in R. Throughout the study, concentrate feed intake was lower in Group T compared to C. There were no significant effects ($P>0.10$) of nutritional management on milk production and BCS. An exception was reported at the last measurement where ewes in Group T had significantly ($P<0.10$) higher milk yield, energy corrected milk yield, fat, protein, lactose and SNF yields, and BCS compared to ewes in Group C (increase by 30.0%, 27.9%, 28.1%, 47.8%, 43.0%, 32.2% and 4.5%, respectively). Overall, results suggest that replacing soybean with a mixture of the studied legumes is not expected to adversely affect the performance of intensively reared dairy ewes. This research has been co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE (project code: T1EDK-04448).

Keywords

Dairy ewes, legumes, soybean, milk production, body condition score

Proceedings of HAICTA 2022, September 22–25, 2022, Athens, Greece
EMAIL: svouraki@vet.auth.gr (A. 1); vipapani@vet.auth.gr (A. 2); eabraham@for.auth.gr (A. 3); pz@for.auth.gr (A. 4); arsenosg@vet.auth.gr (A. 5)
ORCID: 0000-0003-4339-2051 (A. 1); 0000-0002-0481-6651 (A. 2); 0000-0003-4032-5830 (A. 3); 0000-0003-0776-3898 (A. 4); 0000-0003-3224-5128 (A. 5)