

**Lysine and methionine supplementation influence on antler growth of yearling fallow deer (*Dama dama*)**

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For cervid, protein requirement during antler growth is up to 15%. Thus, the requirement of specific amino acids for protein synthesis is also very important. Lysine (Lys) and Methionine (Met) are the two known limiting amino acids for ruminants. And for deer, Lys is very interesting for antler growth, since it is the precursor for collagen production. However, very limiting studies conducting on its effects on antlers. In this study, we show the first trial on a large herd of fallow deer (*Dama dama*) with two experimental designs. Each experiment involved 45 yearling fallow bucks, distributed in three groups based on average weight. The group compositions included Exp. 1: Pasture, Pasture+Barley (0.2 kg/animal per day), and Pasture+Barley+Lys (5 g/animal per day); Exp.2: Pasture+Barley (0.5 kg/animal per day), Pasture+Barley+Lys (9 g/animal per day), and Pasture+Barley+Lys+Met (9 and 3 g/animal per day, respectively). At the first glance, Lys supplementation in the first experiment did not improve any antlers characteristics. However, when the level was increased to 9 g and with the combination of Met in the second experiment, the treatments had good effects on external antler characteristics and antler weight. A very interesting result is the increase in burr perimeter, which is a crucial base for the better and long-term antler growth. The results also suggest a more intense positive effect of amino acid supplementation *in situations* when the animals have a lower performance. This result opens opportunity for improving deer farming practices, particularly for velvet production and trophies.

**Field pea included up to 45% in bull fattening concentrates does not impair *in vivo* digestibility**

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In the last years, the substitution of soybean by legumes has been promoted in Europe to reduce the dependency on soybean imports. Field pea (*Pisum sativum*), which has high starch and protein content, can be included in the diet of fattening cattle. The aim of this study was to compare the apparent digestibility of dry matter (DM) and nitrogen (N) of the diet and blood metabolites due to the inclusion of pea in concentrates. The main ingredients of the concentrates were: 52% corn, 20% barley, 15% corn gluten feed, 9.7% soya and 0% pea (0% pea); 41% corn, 20% barley, 15% corn gluten feed, 15% pea and 5.5% soya (15% pea); 30% corn, 30% pea, 20% barley, 15% corn gluten feed and 1.3% soya (30% pea); 45% pea, 27% corn, 20% barley and 4% corn gluten feed (45% pea). For that, 4 Parda de Montaña young bulls (initial weight 251±4 kg) received restricted amounts of one of 4 concentrates and straw during 4 consecutive experimental periods. The average daily intake of concentrate and straw was 5.0 (±0.02) and 0.68 (±0.001) kg DM, respectively, and it was not affected by pea inclusion (P>0.05). However, the inclusion of pea in the concentrate tended to increase the apparent DM digestibility (P<0.10) and affected N digestibility (P<0.05). The 30 and 45% pea concentrates had greater N digestibility than the 0 and 15% pea concentrates. The intake of N increased linearly with the rate of pea inclusion, the lowest intake was in the 0% pea treatment and the greatest in the 45% pea treatment (P<0.05). The urinary N excretion was greater in bulls with 30 and 45% pea than in the 0 and 15% pea bulls (P<0.05), whereas the faecal N excretion was not affected (P>0.05). The inclusion of pea also affected the retained N, with higher values in bulls receiving the 45% pea than in those with 0 and 15% pea. The plasma concentrations of IGF-1, total protein, β-hydroxybutyrate and urea at the beginning and at the end of each period were not affected by the inclusion of pea (P>0.05). In conclusion, the total replacement of soybean by pea in the fattening concentrate of bulls did not impair digestibility and improved the N retention.

Effect of dietary seaweed supplementation on bovine milk yield, basic composition and iodine content <i>E.E. Newton, Á.H. Pétursdóttir, G. Rikharðsson, C. Beaumal, K. Giannakopoulou and S. Stergiadis</i>	300
Feeding value potential of sweetpotato plant in livestock diet: a review <i>I.F. Olaleru, O.A. Abu and C.O. Okereke</i>	300
Opportunities of reducing environmental pollution by locally grown soybean meal pig diets <i>I. Jansons, V. Sterna and L. Degola</i>	301
A blend of cinnamaldehyde, eugenol and capsicum oleoresin improves rumen fermentation <i>in vitro</i> <i>A. Belanche, E. Jimenez, P. Romero, J.M. Palma-Hidalgo, A.I. Martin-García, A. Blanchart, S. Constantin, H. Khelil and D.R. Yáñez-Ruiz</i>	301
Lupine grain and sorghum distillers' gains improve performance of weaned calves grazing oat pastures <i>V. Beretta, A. Simeone, A.I. Bergós, J. Errandonea and J. García Pintos</i>	302
Oat grain as a fibre source in high-grain diets for beef cattle: rumen fermentation and digestion <i>V. Beretta, A. Simeone, O. Bentancur, M.N. Banchero and V. Martínez</i>	302
The effects of replacing soybean meal from dairy sheep diets on their milk yield and quality <i>A.I. Kalogianni, M. Moschovas, F. Chrysanthakopoulou, G. Katsaganis, G. Manessis, I. Vastardis, I. Bossis and A.I. Gelasakis</i>	303
Effect of yeast ( <i>Cyberlindnera jadinii</i> ) as an alternative protein source on nitrogen balance in mink <i>M. Kjørulf, C. Marcussen, A.-H. Tauson, A.Ø. Pedersen and C.F. Matthiesen</i>	303
Meta-analysis and eco-sustainability of feeding slow-release urea in dairy and beef production <i>S.A. Salami, H. Warren and J. Taylor-Pickard</i>	304
Effect of chitosan on ruminal fermentation, milk production and quality on dairy cattle <i>J. Rey, E. Ugarte, A. Garcia-Rodriguez, I. Goiri, R. Ruiz, N. Mandaluniz and R. Atxaerandio</i>	304
Effects of incorporation of grape stalks in diets for growing rabbits <i>V.R. Costa-Silva, E. Andrade, G. Marques, V. Pinheiro, L. Mendes and M. Rodrigues</i>	305
Impact of red osier dogwood extract on <i>in vitro</i> digestibility and fermentation characteristics <i>W.Z. Yang, W.M.S. Gomaa, A.M. Saleema, E. McGeough, K. Ominski and L.Y. Chen</i>	305
Lysine and methionine supplementation influence on antler growth of yearling fallow deer ( <i>Dama dama</i> ) <i>V. Ny, R. Kotrba, J. Cappelli, D. Bureš, M.A. Clar, A.J. García, T. Landete-Castillejos, L. Bartoň and F. Ceacero</i>	306
Field pea included up to 45% in bull fattening concentrates does not impair <i>in vivo</i> digestibility <i>S. Lobón, I. Casasús, M. Joy and M. Blanco</i>	306
Assessing the effects of dietary inclusion of <i>Cistus ladanifer</i> L. in rumen ciliate protozoa of lambs <i>A. Francisco, O. Guerreiro, E. Jerónimo, M. Dentinho, J. Santos-Silva and R. Bessa</i>	307
Proteaginous extrusion modifies rumen vs duodenum digestion of N, lysine and Maillard compounds <i>P. Chapoutot, O. Dhumez, S. Mendowski, A. Germain, G. Chesneau and P. Nozière</i>	307
Evaluation of guar meal and yellow lupine seeds as alternatives to soybean meal for ruminants <i>C. Guedes, M. Almeida, S. Garcia-Santos, A. Silveira, L. Ferreira, S. Silva, V. Pinheiro, D. Monteiro and M. Gomes</i>	308
Treatment of soybean meal to improve protein utilisation by dairy cows <i>A. Klop, M. Aoun, J.P. Ricaud and G. Van Duinkerken</i>	308

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