

Investigation the effect of albizia (siris) and leocaena (subabul) plants on digestibility, rumen microbial fermentation and serum parameters in one- humped camel

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Abstract

This experiment was conducted to investigate the effect of albizia (siris) and leocaena (subabul) plants on digestibility, microbial fermentation of rumen and blood metabolites in one-humped camel. In the first stage, the best desirable diet among the control diets containing alfalfa and bagasse, diet containing siris leaves and bagasse, siris pod and bagasse, subabul leaves and bagasse and subabul pod and bagasse instead of alfalfa, were selected by *in vitro* methods. The results of this stage showed that the best fermentation, gas production and digestibility was for a diet containing the siris leaf and bagasse. In the second stage, the best desirable diet (containing 60:40 bagasse and siris leaf) and control diet were used in feeding 4 one-humped camels (with 5 years 'age and average weight 300±25 kg) for 1 month (two camels per each diet). Feed intake, digestibility of nutrients, ruminal fermentation parameters, rumination behavior and blood metabolites of animals were measured. The obtained data were used to analysis as a completely randomized design. The results showed that dry matter intake, organic matter and the amount of protein intake by camels in control and experimental diets had no significant difference. Dry matter digestibility and neutral detergent fiber and acid detergent fiber in control diets and siris leaves had no significant difference, but digestibility of crude protein of experimental diet were significantly higher than the control diet. Feeding of siris to camels during the experiment had no significant effect on blood glucose, urea nitrogen, cholesterol and triglyceride. According to results, time to eat, rest, rumination and chewing and each one for nutrients were not affected by the experimental diets. Ammonia nitrogen in the control diet was more than a diet containing siris and pH in the diet containing siris leaves was more than the control diet. The result of these experiments showed due to the positive effect of a diet containing siris leaves on digestibility and fermentation, maybe siris leaves can be used as a replacement with 100% alfalfa in one-humped camel's diet.

Key words: Albizia, Leocaena, Digestibility, Serum Parametert, One-humped camel

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References

- Babadi, L.; Chaji, M. and Mohammadabadi, T. (2018). The effect of feeding whole branch of *Albizia lebbek* tree on digestibility, some fermentation characteristics and rumen protozoa population of Najdi goats. *Journal of Animal Science Research*, 28(1): 195-211.
- Balgees, A.; Elman, A.; Fadal Elseed, A.M.A. and Salih, A.M. (2011). Effects of supplementing a basal diet of treated or untreated baggase with different levels of *Albizialebbeck* on intake, digestibility and rumen fermentation. *Pakistan Journal of Nutrition*, 10(12): 1149-1153.
- Behnamfard, K.; Siadat, S.A.; Bakhshandeh, A.M.; Kashefipour, S.M.; Alami saeed, Kh. and Jafari, A.A. (2013). Investigation of effect of irrigation on feed function and water use efficiency in four Varieties of alfalfa (*Medicago sativa*) in the weather condition of Khuzestan –Ahwaz. *Journal of Agriculture, Irrigation Science and Engineering*, 37(3).
- Bhatta, R.; Krishnamurty, U. and Mhammed, F. (2000). Effect of feeding tamarind (*tamarindus indica*) seed husk as a source of tannin on dry matter intake, digestibility of nutrients and production performance of cross-bred dairy cows in mid lactation. *Animal Feed Science and Technology*, 83: 67-74.
- Bhatta, R.; Shinde, A.K.; Verma, D.L.; Sankhyan, S.K. and Vaithiyathan, S. (2007). Effect of supplementation containing polyethylene glycol (PEG)-6000 on intake, rumen fermentation pattern and growth in kids fed foliage of *Prosopis cineraria*. *Small Ruminant Research*, 52: 45-52.
- Castillo, A.; Cuyugan, O.C.; Foart, S. and Shelton, H.M. (1997). Growth, psyllid resistance and forage quality of *Leucaena leucocephala*, L-pallid L- diversifolia and the F. hybrid of L- leucocephala L- pallida. *Tropical Grasslands*, 31: 188-200.
- Hassan Sallam, S.M.A.; da Saliva Bueno, I.C.; de Godoy, P.B.; Eduardo, F.N.; Schmidt Vittib, D.M.S. and Abdalla, A.L. (2010). Ruminant fermentation and tannins bioactivity of some browes using a semi-automated gas production technique. *Tropical and Subtropical Agroecosystems*, 12: 1-10.
- Hu, W.L.; Liu, J.X.; Ye, J.A.; Wu, Y.M. and Guo, Y.Q. (2005). Effect of tea saponin on rumen fermentation in Vitro. *Animal Feed Science Technology*, 120: 333-339.
- Kennedy, P.M.; Lowry, J.B.; Coates, D.B. and Perlemans, J. (2002). Utilization of tropical dry season grass by ruminants is increased by feeding fallen leaf of *siris* (*Albizialebbeck*). *Animal Feed Science and Technology*, 96(3): 175-192.
- Khy, Y.; Wanapat, M.; Haitook, T. and Cherdthong, A. (2012). Effect of *Leucaena leucocephala* pellet (LLP) supplementation on rumen fermentation efficiency and digestibility of nutrient in swamp buffalo. *The Journal of Animal and Plant*, 22 (3): 564-569.
- Kongmun, P.; Wanapat, M.; Pakdee, P. and Navanukraw, C. (2010). Effect of coconut oil and garlic powder on in vitro fermentation using gas production technique. *Livestock Science*, 127, 38.44.
- Krause, K.M. and Combs, D.K. (2003). Effects of forage particle size, forage source and grain fermentability on performance and ruminal pH in midlactation cows. *Journal of Dairy Science*, 86: 1382-1397.
- Liu, C.D. and Jorgensen, N.A. (1989). *Albizia lebbek* – saponins effect site and extent of nutrient digestion in ruminants. *Journal of Nutrition*, 117: 919-927.
- Makkar, H.P.S. and Becker, K. (1996). Effect of Quillaja saponins on *in vitro* rumen fermentation. In *Saponins Used in Food and Agriculture*. Waller, G. R., Yamasaki, Y., Eds.; Plenum Press: New York. pp: 387-394.
- McDougall, E.L. (1948). Studies on ruminant saliva. 1. The composition and output of sheep's saliva. *Journal of Biochemistry*, 43: 99-106.
- McSweeney, C.S.; Palmer, B.; McNeill, D.M. and Krause, D.O. (2001). Microbial interactions with tannins: nutritional consequences for ruminants. *Animal Feed Science and Technology*, 91: 83-93.
- Min, B.R.; Attwood, G.T.; Reilly, K.; Sun, W.; Peters, J.S.; Barry, T.N. and McNabb, W.C. (2002). *Lotus corniculatus* condensed tannins decrease in vivo populations of proteolytic bacteria and affect nitrogen metabolism in the rumen of sheep. *Journal of Microbiology*, 48: 911-921.
- Mozafarian, V. (2005). *Trees and Shrubs of Iran*. Farhang Maaser Publications. P: 991. (In Persian).

- Muhammad, Z.U.H.; Shakeel, A.; Mughal, Q. and Sezai, E. (2013). compositional studies and antioxidant potential of *Albizia lebbbeck(L.)* Benth. pods and seeds. Turkish journal of Biology, 37: 25-32.
- Patra, A.K.; Sharma, K.; Narayan, D. and Pattanik, A.K. (2003). Response of *gravid dosto* partial replacement of dietary protein by a leaf meal mixture of *Leucaena leucocephala*, *Morus alba* and *Azadirachta indica*. Animal Feed Science and Technology, 100: 171-182.
- Rajablou, M. (2009). Use of Acorn in Animal Nutrition. Internal Newsletter Agricultural Organization of Golestan. 17th ed. P: 94.
- Salem, A.Z.M.; ElAdawy, M. and Robinson, P.H. (2006). Nutritive evaluations of some browse tree foliages during the dry season: secondary compounds, feed intake and in vivo digestibility in sheep and goats. Animal Feed Science and Technology, 127: 251-267.
- Shirdel, Z.; Madani, H. and Mirbadalzadeh, R. (2009). Investigation into the hypoglycemic effect of hydroalcoholic extract of *Ziziphus Jujuba* leaves on blood glucose and lipids in Alloxan-induced diabetes in rats. Iranian Journal of Diabetes and Lipid Disorders, 8: 13-19.
- Welch, J.G. and Smith, A.M. (1977). Effect of beet pulp and citrus pulp on rumination activity. Journal of Animal Science, 33: 472-475.
- Wina, E.; Muetzel, S.; Hoffman, E.; Makkar, H.P.S. and Becker, K. (2005). Saponins containing methanol extract of *Sapindus rarak* affect microbial fermentation, microbial activity and microbial community structure in vitro. Animal Feed Science and Technology, 121: 159-174.
- Yildiz, S.; Kaya, I.; Unal, Y.; AksuElmali, D.; Kaya, S.; Cenesiz, M. et al. (2005). Digestion and body weight change in Tuj lambs receiving oak (*Quercus hartwissiana*) leaves with and without PEG. Animal Feed Science and Technology, 122: 159-1.