Abstract

The aim of this study was to investigate the effect of powdered cumin, fennel and yeast seeds on yield, carcass characteristics, blood metabolites and rumen ecosystems fed with high concentrate diets compared to monensin. In this study, the amount and proportion of cumin, fennel powder, yeast and monensin were determined by using the gas production method and laboratory methods, and the amount of produced gas, rumen ammonia nitrogen and particle size (PF) Accordingly, the level of 8 grams of cumin mixture with 50% cumin and 50% fennel, 5 g yeast and 30 mg monensin per kilogram of dry matter were selected as the best levels. After determining the appropriate amount of cumin, fennel, yeast and monensin, Using five fistulate sheep (55 ± 2.5 kg and 16-18 months old), the fistula was measured in terms of lattice square design, the rate of protein degradation (In Situ), fermentation parameters and rumen protozoan count. Adding cumin and fennel powder, mixing cumin and fennel with yeast and monensin to the base diet significantly reduced the effective degradation of protein in the rumen ($P<0.05$). But the addition of yeast to the base diet did not have a significant effect on the protein degradability of the base diet ($p>0.05$). Addition of cumin, fennel, yeast and monensin powder significantly increased the total rumen volatile fatty acids significantly ($P<0.05$). Ammonia nitrogen content decreased significantly by adding cumin, fennel and monensin powder ($P<0.05$). The addition of yeast and the composition of cumin, fennel and yeast to base diet significantly and significantly increased the total protozoan content of the rumen and the addition of monensin significantly decreased the total protozoal population in the rumen. In the third stage, 25 male lambs (30 ± 2.5 kg and 3-4 months old) were allocated to 5 groups and 5 lambs per group. In a completely randomized design, single cages were kept for 66 days. Groups of: 1 base diet, 2 base rations + 8 g mixture of powdered cumin and fennel, 3 base rations + 8 g mixture of powdered cumin and fennel and 5 g yeast, 4 base rations + 5 g yeast and 5 - The base ration was 30 mg of monensin. The experimental treatments significantly increased the yield (daily gain) and consumed dry matter (kg / day) and the improvement in the feed conversion ratio (kg of feed consumed per kg of daily gain) ($p <0.05$) On day 57, blood samples were collected from lambs' veins and after blood serum extraction, blood parameters were measured. Addition of cumin and fennel powder, yeast and monensin significantly increased blood glucose ($P <0.05$). Triglyceride and cholesterol levels, serum urea in

lambs were significantly decreased by using cumin and fennel powder (P <0.05). The amount of microbial protein in the experimental groups was measured on day 50 of fattening period by using metabolic cages and by measuring the purine derivatives of urine in lambs (6 consecutive days). The results showed that the addition of cumin, fennel and monensin to base diet significantly reduced the synthesis of microbial protein compared to control (p <0.05). The level of microbial protein synthesis increased significantly by adding yeast to base diet (P <0.05). At the end of the breeding period (66 days), two lambs were slaughtered in each treatment and 10 lambs were slaughtered. There was a significant difference in carcass yield, tibia and fat in the calf cavity (P <0.05). Among the treatments, the addition of 8 grams of cumin and fennel to the base ration caused the highest increase in carcass yield and decrease in the ratio of fox to total carcass. The results of this study and the economic analysis of the plan show that the addition of 8 grams of powdered cumin and fennel (with an equal ratio) to diets of fattening lambs fed with the supplemented concentrate diet, improved rumen fermentation, increased production of volatile fatty acids, decreased number Protozoans and reducing dietary protein degradability improve the yield and yield of livestock carcasses and adding 8 grams of cumin and fennel powder to the diet of lamb fattening is economically viable (P <0.05).

Key **words**: Herbal Medicine, Yeast, Defective fermentation, Performance, Carcass characteristics

University of Zabol
Graduate School
Department of Animal Science

Dissertation Submitted in partial Fulfillment of the Requirement for the Philosophy degree (PhD) in Animal Nutrition

Title

Effect of fennel, cumin seed powder and yeast on growth performance, carcass characteristics, blood metabolites and rumen ecosystem of fattening lambs fed high-concentrate diets

Supervisors
Dr. M. Yusef Elahi
Dr. H. Mirzaei

Advisors
Dr. A.Z.M. Salem
Dr. A. Azarfar
Dr. A. Azizy

By
Mehrdad Taghizadeh

September 2018