



MINISTRY OF JIHAD-E-AGRICULTURE
AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION ORGANIZATION
Agricultural and Natural Resources Research and Education Center of Ilam Province

Effect of oak acorn with and without polyethylene glycol on reproductive performance, blood parameters and immune response in native goats of Ilam province

Research worker: Hoshang Jafari

Abstract

The aim of this experiment was to study the effects of two levels of oak (*Quercus persica*) acorn (OA) with or without polyethylene glycol (PEG; molecular weight = 6000) during the last 60 days of pregnancy on dry matter intake (DMI), apparent total tract nutrients digestibility, ruminal fermentation parameters, protozoa population, urinary purine derivatives (PD), plasma metabolites, hematology, colostrum composition and immunoglobulin (Ig) G level of native goats and their kids. Forty multiparous pregnant goats (41.8 ± 2.3 kg BW) were used in a 2×2 factorial arrangement. Oak acorn was used in two levels of 20 or 40% of diet dry matter with (20 g/day per animal) or without PEG. In addition, a control diet without OA and PEG was used. Hence, experimental diets were: control, 20% of OA without PEG (OA_{20-PEG}), 20% OA with PEG (OA_{20+PEG}), 40% OA without PEG (OA_{40-PEG}) and 40% OA with PEG (OA_{40+PEG}). Goats fed OA₄₀ had lower DMI, DM, OM, CP and NDF digestibility, nitrogen (N) intake and N retention ($P < 0.01$) compared to those fed OA₂₀ diets. Ruminal fluid NH₃-N ($P < 0.01$), total volatile fatty acids (VFA; $P = 0.05$) and propionate ($P < 0.01$) concentrations were lower in animals fed OA containing diets. Ruminal acetate concentration decreased linearly with increasing OA level in the diet ($P = 0.01$). Addition of PEG to the OA containing diets increased CP digestibility ($P < 0.01$), ruminal NH₃-N ($P < 0.05$), total VFA, acetate and propionate ($P < 0.01$) concentrations. Urinary PD ($P < 0.01$) and total protozoa population ($P < 0.01$) decreased linearly with increasing OA level in the diet. Goats fed OA₄₀ had lower BW changes compared to those fed OA₂₀ diets ($P < 0.01$). Whereas kid's birth weight was not affected by experimental diets ($P > 0.05$). Goats fed OA containing diets had lower plasma IgG ($P < 0.01$), glucose ($P < 0.01$), triglyceride ($P < 0.01$) and Fe concentrations ($P < 0.05$) compared to those fed the control diet. Plasma urea decreased linearly ($P = 0.01$) and alanine aminotransferase (ALT; $P < 0.01$) concentration increased linearly with increasing OA level in the diet. Goats fed OA containing diets had lower colostrum IgG concentration ($P < 0.05$) compared to those fed the control diet. Kids plasma total protein concentration was not affected by experimental diets ($P > 0.05$),

whereas kids born from goats fed OA containing diets had lower plasma IgG level compared to the control diet ($P < 0.01$). Addition of PEG to OA containing diets increased plasma total protein ($P = 0.05$) and IgG ($P < 0.05$) level of kids. It can be concluded that feeding OA during the last 60 days of pregnancy had negative effects on DMI, nutrients digestibility, ruminal fermentation and colostrum quality which may have adverse effect on performance of pregnant goats and kid's survival.

Keywords: blood parameters, colostrum, immunoglobulin, oak acorn, PEG, pregnant goat, ruminal fermentation.