



MINISTRY OF JIHAD-E-AGRICULTURE

Agricultural Research, Education and Extension Organization

Kerman Agricultural and Natural Resources Research and Education Center

Survey on protection of Protein of soybean and canola meals in rumen by using of pistachio by-product extract

Research worker: Pirouz Shakeri

Abstract

The objective of this study was to evaluate the effects of different doses of pistachio by-products (PBP) extracts on the protein protection from ruminal degradability in soybean and canola meals. PBP were extracted by four different solvents, i.e. 70% ethanol, 80% methanol, a mixture of chloroform+methanol (CME), and water. Different levels of the PBP extracts (extracted from 125, 250 and 375 mg PBP) were added to 250 mg alfalfa hay and 250 mg barley grains as two various basal feeds (substrates) and incubated for gas test, where the gas production, ammonia nitrogen and volatile fatty acids concentrations were determined. An *in situ* trial was conducted to determine ruminal degradability and disappearance of proteins in soybean and canola meals treated with 0.5 and 1 % tannins extracted form of PBP. The total extraction of phenolic compounds and total tannin contents with water, ethanol, methanol and mixture of chloroform and methanol extracts of PBP were 36.96, 65.78, 67.02 and 8.85 % and 37.11, 9.64, 56.87 and 7.55 %, respectively. Inclusion of CME reduced ($P<0.01$) the gas yield in both of alfalfa hay and barley grains. Addition of PBP extracts to barley grain decreased ammonia nitrogen compared to alfalfa hay ($P<0.01$). Soybean meal supplementation with 1 % tannin from water extract, 0.5 and 1 % tannin from ethanol, moreover, canola meal processing with 0.5 % tannin from water and 1 % tannin from ethanol extracts decreased the ruminal disappearance of protein ($P<0.01$) without limitation of total gastrointestinal disappearance of protein. Also, the addition of all extracts to soybean meal and 0.5 and 1 % water extracted tannin to canola meal reduced ($P<0.01$) the concentration of rapidly degradable proteins. In

conclusion, the results showed that using 0.5 and 1 % of water and methanol extracts to soybean and canola meals could be effective in protein protection from ruminal degradability.

Key words: Degradability, Disappearance, Extract, Pistachio by-product, Protein, Tannin.