

THE EFFECTS OF DIFFERENT PROTEIN SOURCES IN LAYING HEN DIETS ON NUTRIENT VALUE AND *IN VITRO* NUTRIENT DIGESTIBILITY

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ABSTRACT

The aim of this study was to evaluate the nutrient value and *in vitro* digestibility of laying hen fed diets contained different protein sources. The proximate analysis was conducted to determine the levels of organic matter, dry matter, crude protein, crude fiber, extract ether, and *in vitro* analysis was carried out to assess the levels of crude protein digestibility in each diet. The study employed three treatments with five replications, in one-way ANOVA analysis. The treatments were T0 = Plant-based protein source (cage free system), T1 = Animal-based protein source (commercial feed), T2 = Animal-based protein source (self-mixed). All data were pooled statistically analyzed using a completely randomized design. Data with significant difference were further tested using Duncan's new Multiple Range Test. Proximate analyses showed that no difference were found in dry matter, organic matter, ash, and nitrogen-free extract between all treatment diets. However, plant-based protein source (cage free system; T0) and animal-based protein source (commercial feed; T1) contained higher crude protein than animal-based protein source (self-mixed; T2). T0 and T2 contained higher crude fibre than T1 ($P < 0.05$). T0 contained ether extract higher than that of T1 and T2. The results of this study indicated that there were no difference in crude protein nor dry matter digestibilities between laying in all treatment diets. However, laying hens which fed diets containing self-mixed animal-based protein source (T2) had higher organic matter digestibility ($P < 0.001$) than laying hens which fed diets contained plant-based protein sources in cage free (T0) and diets contained commercial animal-based protein source (T1). There was no difference found in organic matter digestibility between laying hens fed diets contained plant-based protein sources in cage free (T0) or diets contained commercial animal-based protein source (T1). It might be concluded that even though animal-based protein source (self-mixed) contained less crude protein, but gave better higher organic matter digestibility than those of plant-based protein source (cage free system) or animal-based protein sources in commercial.

Keywords: Animal Protein, Laying hens, Nutrient Content, Plant protein, Protein Digestibility,