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The effect of interaction supplemental crystalline amino acid on efficiency of dietary amino acids for broiler chickens

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Abstract

The present study investigated the effects of diets with different protein quality and supplemented with different levels of crystalline amino acids on performance, energy and protein efficiency, carcass components, intestinal morphology, immune response, enzymatic activity in the intestinal tissue, litter characteristics, amino acids digestibility and .economic utility in broiler chickens. In this study 576 one day old Ross 308 (mixed sex) broiler chickens were examined which considered six replicates for each experimental treatment with 12 chickens per replicate. Experimental treatments were examined in a 2×4 factorial experiment based on a completely randomized design consisted including two experimental diets maize-(diets based on maize-soybean meal as high quality protein source and diets based on wheat-canola meal as lower quality protein source) and four levels of crystalline amino acids (recommended levels, 0 or without supplemented crystalline amino acids, 10 and 15% higher than the recommended levels) during the starter, grower and finisher periods. The results of this study showed that adding crystalline amino acids at levels of 10 and 15% higher than the recommended level to diet containing canola meal and wheat caused an increase on energy and protein consumption (P<0/05), thus reduced energy and protein efficiency (P<0/05) and an increase on feed intake and body weight at 29 to 42 days old (P<0/05). Also, with adding crystalline amino acids at levels of 10 and 15% higher than the recommended level to diet containing canola meal and wheat, increase on the number of heterophile and heterophile to lymphocyte ratio (P<0/05) and decreased the number of lymphocyte (P<0/05). On the other hand, adding crystalline amino acids at levels of 10 and 15% higher than the recommended level in a low-quality diet were not significantly affected dry matter, nitrogen and ammonia nitrogen in the litter (P>0/05). Also, the results of this sudy showed that diets with high and lower protein quality no significant difference in the metabolizable energy and protein digestibility (P>0/05). Diet with lower protein quality had less nitrogen digestibility (P<0/05). The findings of this experiment showed that adding crystalline amino acids at levels higher than the recommended level to dietary with high quality caused a significant decrease on apparent digestiblity total amino acids (P<0/05). Furthermore, results of this study showed that diet with high protein quality relative to the usual diet with adding crystalline amino acids caused an increase on feed cost and feed cost per body weight (P<0/05) and decreased gross economic profit. According to the results of this study, the use of crystalline amino acids higher

than the recommended level (10 and 15%) in the diets with high quality (as maize-soybean meal) has no effect on the performance of broiler chickens, while, the apparent digestiblity of the total amino acids in the diet was reduced.

Key Word: Broiler, Crystalline Amino Acids, Diets with Different Protein Quality, , Enzymatic Activity, Performance.