Summary

The use of diets with an adequate amino acid profile in turkey nutrition plays an important role in ensuring proper metabolism and allows turkeys to optimize their growth potential. In fast-growing turkeys, it is crucial to meet the demand for amino acids, which are involved in the synthesis of structural proteins and catalyze numerous biochemical reactions. The study was conducted in three experiments and the objectives were:

-determine the effect of different proportions of Arg, Met and Lys in diets with low Lys recommended by NRC (1994) on production performance, metabolism, immune and oxidoreductive status of turkeys;

-determining the effects of different proportions of Arg, Met and Lys in diets with Lys content close to breeding company recommendations (BUT, 2018) on growth performance, metabolism, oxidoreductive status of turkeys; and

-determining the effect of two arginine (95% and 105%) to lysine (Lys) ratios, where the Lys content of the diet was in line with NRC (1994) recommendations or 10% higher, on the metabolism, oxidoreductive status and growth performance of turkeys.

Experiments were conducted on one-day-old Hybrid Converter turkey chicks. In Experiment 1, an isocaloric diet containing 1.60, 1.50, 1.30 and 1.00% Lys was fed to the birds during each of the 4 feeding phases. The experiment had a completely randomized 3 x 2 factorial design with 3 levels of Arg (90, 100 and 110%) and 2 levels of Met (30 or 45%) relative factorial 3 x 2 with 3 levels of Arg (90, 100 and 110%) and 2 levels of Met (30 or 45%) relative to the Lys content of the diet. In Experiment 2, birds were fed ad libitum isocaloric diets with high Lys content, about 1.83%, 1.67%, 1.48% and 1.20% for four consecutive periods. The study was conducted in a two-factor design with three levels of Arg (90%, 100% and 110%) and two levels of Met (30% and 45%) in relation to the Lys content of the diet. In experiment 3, turkeys were fed ad libitum isocaloric diets with varying levels of Lys and Arg. The study was conducted in a two-factor system with two levels of Lys (low and high - LL and LH) and two levels of Arg (low and high - AL and AH). It was found that when using a diet containing the level of Lys recommended by NRC (1994), the optimal level of Arg should be 100% and the level of Met should be 45% of Lys content, because with such proportions the best growth performance of turkeys, improvement of metabolism and the immune and antioxidant system can be obtained. It was found that in growing turkeys fed diets with a Liz

content close to the recommendations of breeding companies (BUT 2018), the proportion of Arg can be reduced to 90%Liz with a Met level of 45% Liz content, because with such proportions there is no deterioration in the growth performance of turkeys, metabolism and the antioxidant system function efficiently. It has been established that in turkey diets it is beneficial to increase the level of Liz by 10% over the content recommended by the NRC, (1994). At the same time, with an increased Liz content, it is reasonable to use a higher Arg content (105% Liz). Although the indicated Arg:Liz ratio did not improve the growth performance of turkeys, its beneficial effect on the body is evidenced by the improvement of metabolic rates and antioxidant status of turkeys. Compared to the lower level of Arg (95% Lys) in the diet, increasing the amount of this amino acid to 105% Lys did not improve growth performance, metabolism or antioxidant status. An Arg level of 95% Lys can be used in turkey diets containing 10% more Lys than recommended by the NRC (1994).

Keywords: amino acids, metabolism, turkeys