

Research Article

Effect of lysine on growth performance and activity of lipase and amylase in domestic quail, *Coturnix japonica* diets

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Abstract: This work aimed to study the effect of dietary amino acid lysine supplementation on growth performance and activity of the digestive enzymes in the intestine in quail diets. A total of 180 one-day-old Japanese quail were divided into four groups, each with 45 chicks and 3 replications. The experiment was performed for 42 days. Group one was control, and those 2, 3 and 4 were fed a basic diet with amino acid lysine added at concentrations of 0.5, 0.9 and 1.03%, respectively. The results showed a significant improvement in the growth performance in terms of body weight and feed conversion ratio in quail birds. A significant activity of the intestinal digestive enzymes of amylase and lipase was also observed in the treated birds. We concluded that dietary lysine supplementation at a rate of 0.9 to 1.03% enhances the growth performance and as the activity of digestive enzymes of amylase and lipase in raising quail birds.

Keywords: Lysine, Quails, Weight, Amylase, Lipase.

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Introduction

Poultry is one of the important sources of animal protein. Due to the unique characteristics of quail (*Coturnix japonica*) meat, the demand for this protein source has increased recently because of its high nutritional value (Embury 2000; Nahashon et al. 2004). Amino acids such as lysine play an important role in the metabolism of birds when consumed, which promotes improved product performance and bird health (Wu et al. 2014; Liao et al. 2015). In poultry, adding corn and soybean with the amino acid lysine is a common practice, and therefore there is a significant effect when on the growth performance and carcass quality of birds (Zhai et al. 2016). When Lysine is added at high levels to the bird's diet, the secretion of insulin is stimulated, and the absorption of lysine increases and therefore, protein is created in the body tissues (Sturkie 1986; Murray et al. 1998).

Mehri et al. (2010) conducted a trial for broilers from 2 to 4 weeks and they estimated the requirements for digestible lysine using different levels.

Increased breast meat is usually due to the higher nutritional density of amino acids resulting in more lean muscle tissue rather than collagen (Corzo et al. 2010). Zhai et al. (2012) showed that the consumption of lysine in high proportions above the need for nutritional requirements led to an increase in the growth of breast muscle. The use of lysine at high levels in bird diets, exceeding the recommended limit, causes the deposition of fat in the abdomen, breast and thigh muscles, an increase in the rate of body weights, and the efficiency of food conversion of breast meat (El-Wahab et al. 2015; Zhai et al. 2016). Also, recent studies in birds have indicated that supplemental lysine can stimulate their immune system (Faluyi et al. 2015; Saleh et al. 2018). Hence,