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The Impact of Folic Acid and B_{12} Administration on Growth, Wool Traits and Some Hormones Concentrations of Male Arabi Lambs

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This study aimed to investigate the effects of folic acid and vitamin B_{12} administration on the growth and wool traits in male lambs. A total of fifteen animals was used from 1st February 2015 to 30th April 2015, divided into three treatment groups. The first group served as a control, the second group received a folic acid dosage equivalent to 0.5 mg per kilogram of body weight per head, and the third group received a vitamin B_{12} dosage equivalent to 0.1 mg per kilogram of body weight per head. The vitamins were administered orally twice a week. The results showed a significant improvement ($P<0.05$) in final body weight, daily gain, and total weight gain in the vitamin B_{12} and folic acid groups compared to the control group. Additionally, there was a significant ($P<0.05$) increase in all wool characteristics, except for crimp number, in the folic acid group compared to the control group. The study demonstrated significant relationships between body weight and every aspect of wool quality except for fiber length. There was a significant ($P<0.05$) increase in the concentrations of growth and thyroxine hormones in the vitamin B_{12} and folic acid groups compared to the control group, particularly in the second and third months of the experiment. No significant difference in insulin hormone concentration among the groups was observed during the 90-day experiment. In conclusion, administering vitamin B_{12} and folic acid are orally administered twice a week to improve growth, increase hormone concentrations (thyroxine and growth hormone), and improve wool quality.
Keywords: Vitamins, sheep, body weight, metabolic hormone, wool characteristics.

INTRODUCTION

Sheep play a critical role in the agriculture industry as they provide meat, wool, milk, and other products (Al-Sayegh and Al-Kass, 2006). In general, a deficiency in providing ruminant animals with their vitamin needs, especially during stages of intensive production or pregnancy, may cause symptoms such as decreased meat and milk productivity, body growth, and hormone production (Frye *et al.*, 1991). Vitamins are essential for various physiological processes, including the metabolism of proteins and energy, improved nutrient utilization, increased appetite and feed conversion efficiency, and growth and development in mammals (Rafeeq *et al.*, 2020). The vitamin requirements in animals and humans greatly depend on their health, physiology, and productivity, such as milk, meat, wool, hair, egg production, and reproduction., most ruminants do not suffer from a deficiency of the B-vitamin group due to the ability of rumen microorganisms to synthesize these vitamins and their availability in the consumed feeds, however, under certain conditions such as stress and high production, the need for additional vitamins has been recently established to meet their requirements, for example, vitamin B_{12} cannot be synthesized in the rumen when cobalt is not available in the diet (McDowell, 2006).Water-soluble vitamins essential for numerous physiological processes (include folic acid and vitamin B_{12}), functions as a cofactor in several enzymatic activities related to amino acid metabolism, DNA synthesis, and cell division. It is also essential for the creation and maintenance of genetic material, making it crucial for rapid cell growth and division (Bailey and Gregory, 1999; Wagner, 2001).

Folic acid improves metabolic health, reproductive characteristics, and pregnancy outcomes in sheep (Almahdawi and AL-Shimmery, 2019). Almahdawi (2019) concluded in their study on ewes and their lambs that the reproductive and productive performance of pregnant ewes is improved by folic acid and cobalt together, this combination increases daily milk production, promotes weight gain, improves feed conversion efficiency at weaning, and reduces anemia while increasing red blood cell synthesis.Vitamin B_{12}, through the vitamin B12-dependent enzyme methylmalonic-

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