

# EFFECT OF DRIED TOMATO POMACE AS ALTERNATIVE TO VITAMIN C SUPPLEMENTED DIETS IN HEMATOLOGICAL INDICES AND OXIDATIVE STABILITY OF EGG YOLK OF LAYING HENS IN HIGH-AMBIENT TEMPERATURE

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**ABSTRACT :** The present experiment was aimed to estimate the influence of dried tomato pomace (DTP) as alternative to vitamin C supplemented diet on the oxidative stability and hematological indices in the egg yolk of laying chickens treated with high heat stress. Two hundred laying chickens from Lohman brown strain at the age of 34 weeks, were distributed into five treatments, 4 replicates 10 chickens (40/treatment) maintained at high ambient temperature. Chickens were fed laying diet without addition, laying diet with addition of vitamin C (300mg/kg), and 1, 2, 3% of DTP respectively. Although blood indices of chickens was similar ( $p>0.05$ ) and DTP decreased triglyceride concentration, glucose, and cholesterol. The oxidative status for cholesterol egg yolk was improved through the use of diets supplemented with vitamin C and DTP as well as decreased MDA values. The result of the study indicate that DTP, and vitamin C supplementing modulates the oxidation-antioxidation system of hematological indices and egg yolk peroxidation in laying chickens treated with high ambient temperature.

**Key words :** Heat stress, dried tomato pomace, vitamin C, antioxidant, hematology indice.

## INTRODUCTION

The effect of higher heat stress was considered as a main causes of growth performance decreased, egg production, nutrient, availability, immunity, and quality in laying chickens as well as broiler chickens. Furthermore the environmental temperature above 32°C, large production losses are readily evident (Kirunda *et al*, 2001; Mahmoud *et al*, 2003; Sahin *et al*, 2008; Mahmoud *et al*, 2004; Rozenboim *et al*, 2007; Lara *et al*, 2013). Unsaturated fatty acids were in high levels in the egg yolk which leads to higher susceptibility to lipid oxidation. Several studies were conducted to estimate the antioxidants effect in chicken diets to improve quality of eggs as well, increase the shelf life due to the effect of oxidation that cause damage in eggs during the storage period (da Cruz *et al*, 2016).

The production of active oxygen materials (ROS), could be increased due to high temperature degree which may result in deterioration to critical biomolecules including fatty acids, DNA and proteins, which leads to reduce welfare performance. Vitamin E and C inclusion were detected to be beneficial in reducing heat stress

associated with physiological responses as well as improving heat resistance by their antioxidant effects (Ipek *et al*, 2007; Sahin *et al*, 2003; Kucuk *et al*, 2003; Ahmed *et al*, 2008; Chung *et al*, 2005; Sahin *et al*, 2006).

Dried Tomato Pomace (DTP) consist of 44% seed, 56% pulp and skin, seed was the main part of pomace that consist of 22.2-33.9% protein, 35.1% total dietary fiber, 20.5- 29.5% fat and 3.9-9.6% ash (Rahmatnejad *et al*,(2009). Additionally, per gram of dried pomace powder (naturally dried) included CP (11%), fat (4.5%),  $\beta$ -carotene (0.13 mg), lycopene (0.8 mg), vitamin C (1.73 mg), and  $\alpha$ -tocopherol (0.07 mg) (Sahin *et al*, 2008).

Tomato items contain phytochemicals that may have wellbeing points of interest as well, considered as a source of important ingredients like lycopene, vitamin A, phenols, folate, vitamin C and flavonoids which were potential bioactive compound included in tomato (Agarwal and Rao, 2000; Beecher, 1988). As well as lycopene and pigment were the carotenoid with high amplitude of oxygen captivate because the existence of two non-conjugated double bands resulted in a higher activity (Moreira and Shami, 2004).