

EGG QUALITY OF HEN AFFECTED BY DIFFERENT LEVELS OF QUERCETIN

Ali R. Abid^{1,2} and Suad K. Ahmed¹

¹College of Agricultural Engineering Science. University of Baghdad.Iraq

²College of Veterinary Medicine. University of Kerbala. Iraq

(Received 21 December 2018, Revised 10 March 2018, Accepted 19 March 2019)

ABSTRACT : This study was conducted to investigate the influence of different levels of quercetin on egg quality of layer hens. Hens were reared in temperature controlled and well ventilated private hall for 20 weeks for five periods(28day/period).A total of 120 hens (Isa Brown) 40 weeks of age, supplied by Hendrix Genetics Company, were distributed randomly into four treatments, each treatment contained three equal replicates (10 hens/replicate). Hens were fed on the same basal diet during the adaptation period for one week which contained 17% crude protein with 2750 Kcal/kg diet energy. Experimental treatments were as follow: T1(Control): basal diet without any addition, T2: basal diet supplemented with 400mg quercetin /kg diet, T3: basal diet supplemented with 800mg quercetin/kg diet, and T4:basal diet supplemented with 1200mg quercetin /kg diet. The results showed that, albumin height and haugh unit attained significant($p \leq 0.05$) differences in T2 at 2nd-4th periods. Yolk height and diameter got significant($p \leq 0.05$) differences at 4th and 1st periods, respectively, the additive treatments T2 and T3 recorded the better treatments. Yolk color and index achieved significant($p \leq 0.05$) difference at 2nd-5th periods, the additive treatments were recorded the better measurement comparing with control, also, shell thickness increased significantly($p \leq 0.05$) during 3rd-5th periods, T2 and T4 achieved the better groups for shell thickness, T2 was surpassed in shape index at 2nd period only.In conclusion, our study provide an evidence that quercetin may be beneficial in improving egg quality to some extents in laying hens at certain levels.

Key words : Egg quality, hen, quercetin.

INTRODUCTION

Performance and egg quality such as egg production, eggshell quality and nutrients in eggs will decrease with increasing age specially after the end of laying peak period. Genetics, feed quality, and environment are involved in the performance and egg quality in laying hens, the decline of performance is mainly due to changes in hormone concentrations, thereby resulting in restriction of growth and development of follicles, thus decreases of ovulation, egg quality and components (Ying *et al*, 2015).

Supplementation of natural feed additives as flavonoids in poultry diets is common and widely used in order to improve poultry health and egg production (Ting *et al*, 2011; Surai, 2013), improve the nutrients utilization (Dhama *et al*, 2015; Alagawany *et al*, 2016).

Quercetin (generally recognized as safe) is a flavonoid that widely distributed in vegetables and plants. It has been demonstrated to possess a wide range of biological effects that are considered beneficial to health, including antioxidative, anticancer and antiviral activities (Formica and Regelson, 1995).

Many studies proved the quercetin has ability to

prevent the oxidation of low-density lipoproteins (LDL) by scavenging free radicals and chelating transition metal ions. Consequently prevention of certain diseases, such as cancer, atherosclerosis, and chronic inflammation (Kim *et al*, 2006).

In poultry, quercetin has potential to improving performance and egg quality in laying chicken through increasing of egg production, improved egg quality and reduced yolk cholesterol at certain concentrations. (Liu *et al*, 2013)

Ying *et al*,(2015) reported that there were increases in eggshell strength, eggshell thickness and haugh unit as quercetin supplementation level increased.

Provision of hens diet with quercetin at 0.5g/kg feed reduced egg yolk cholesterol content as well as the cholesterol ester, free fatty acids and phospholipids fraction increased (Iskender *et al*, 2017). Also, It has been shown that improve oxidative status of broiler meat when added to the birds' feed and prolong the shelf-life of poultry meat (Rupasinghe *et al*, 2010).

The goal of the present study was to investigate the impacts of quercetin on the egg quality parameters of hens.