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EFFECT OF SUPPLEMENTING EXTENDER WITH MELATONIN ON IRAQI NATIVE SEMEN QUALITY DURING COOLING STORAGE

Mohammed A. AL-Bayar*, W. I. ALjugaifi, Ammar R. Mansoor, Omar M. Nassif and Moumen H. Atallah

Department of animal production, College of Agriculture, University of Anbar, Ramadi, Iraq.
*e-mail : ag.mohammed.ala@uoanbar.edu.iq

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ABSTRACT : This study aimed to evaluate supplementation of Melatonin to Lake 1960 chicken semen extender and semen liquid storage under 5 C to semen quality. In this study, 20 fertile Iraqi native roosters used. Semen collected from all roosters (pooled sample) in a glass tube for 3 times, 3 days per another one. Semen divided into 4 tubes and diluted 1:1 by using Lake 1960 extender with 0, 0.5, 1 and 1.5 mM/L melatonin to the extender, then stored under 5C in glass tubes for 0, 12, 24, 48, 72 and 96 hours. Sperms individual motility, viability, abnormality, and acrosomes abnormality evaluated for each treatment and time storage. The results showed that decreasing (Pd≤0.0001) in sperms individual motility for all Melatonin treatments compared with control groups at 96 hours. No significant differences between Melatonin treatments and control for another storage times. Decreasing (Pd≤0.05) in sperms abnormality in 1.5 mM/L Melatonin for 96-hour storage compared with other groups. Decreasing in acrosomes abnormality (Pd≤0.05) in 1.5 mM/L Melatonin for 24- and 48-hours storage. Moreover, Melatonin supplementation to semen extender improved sperms motility and decreasing sperms and acrosomes abnormality.

Key words **:** Chicken semen, melatonin, semen quality, cooling storage.

INTRODUCTION

Artificial insemination in poultry becomes an important role in the poultry industry, but there are several factors reduce semen quality and fertility during semen *in vitro* storage. Sperms always accompanied by membrane phospholipid peroxidation, which cause deterioration in semen quality (Meamar *et al*, 2016). Sperm membrane component from Phospholipids and it's responsible for liquidity of sperm membrane bilayer (Zaniboni and Cerolini, 2009). Polyunsaturated fatty acids (PUFA) is a main component of sperm membrane structure and cause cell very sensitive to peroxidation during *in vitro* storage (Fujihara and Koga, 1984; Cerolini *et al*, 2006; Meamar *et al*, 2016). Consequently, the sperm cell membrane is sensitive to oxidative effects, especially it has limited scavenging enzymes, thus making them highly susceptible to ROS damage (Henkel, 2005). So, the level of ROS is required for sperm function (Agarwal and Prabakaran, 2005). Because of high concentrations of sperm with minimal seminal plasma in avian species (Etches, 1994). This makes oxidative stress affect negatively on semen quality. In avian species spermatozoa, antioxidant defense system Include enzymes such as glutathione peroxidase (GSH-PX) and superoxide dismutase (SOD), water and lipid soluble antioxidant like vitamin A, C and E, protease, phospholipase and transferase which repair or remove damaged molecules by cellular oxidative stresses (Breque *et al*, 2003; Mohammed et al,2018a). Melatonin is a hormone secreted mainly by the pineal gland and act powerful antioxidant by inhibiting the activity of nitric oxide synthase (NOS) (Reiter *et al*, 2001; Mohammed *et al*, 2018b). Scavenger of free radicals and counteracts the generation of free radicals (Barrenetxe *et al*, 2004), Potently scavenge ROS (Tan *et al*, 2007), Protect cells from free radicals through metabolism (Kang *et al*, 2009). Melatonin plays a role by inducing antioxidant enzymes activity by increasing SOD and GSH-Px gene expression in sperms membrane (Ramadan *et al*, 2009). Melatonin shows a powerful antioxidant than vitamin E by purifying peroxide radicals (Roo-) a consequence of lipid peroxidation (Hardeland *et al*, 2011; Yassa *et al*, 2011). Reducing oxidation of lipids due to the purifying activity of OH Radicals (Ahmed *et al*, 2011). Reducing the sensitivity of the sperms and prevent damage by oxidation (El-Raey *et al*, 2014). This study conducted to evaluate the effect of Melatonin addition to rooster extender (Lake 1960) and semen liquid storage at 5C to semen quality.