

Effects of Eggshell Pigmentation and Egg Size on the Spectral Properties and Characteristics of Eggshell of Meat and Layer Breeder Eggs

T. M. Shafey*, T. H. Al-mohsen, A. A. Al-sobayel, M. J. Al-hassan and M. M. Ghnnam¹

Department of Animal Production, University of King Saud, College of Agriculture

P.O. Box 2460, Riyadh 11451, Saudi Arabia

ABSTRACT : The effects of eggshell pigmentation and egg size (medium and large) on the spectral properties and characteristics of eggshells were examined in eggs from two genetic groups of breeder flocks. Birds from meat (Hybro, pigmented eggshell, PES) and layer (Leghorn, non-pigmented eggshell, NPES) at 40 and 46 weeks of age, respectively, were used. Measurements of per cent shell (PS), shell thickness (ST), shell volume (SV), shell density (SD), egg shell conductance (EC) and physical dimensions of eggs were made. The spectral properties of eggshells were measured over the wavelength (WL) range of 200 to 1,100 nm. Eggshell absorbed approximately 99.8 percent of the light and transmitted only about 0.12 percent with a maximum light transmission at the near-infra-red region of about 1075 nm. It attenuated shorter WL and transmitted longer WL. Eggshell pigmentation and egg size influenced light transmission into the egg. The NPES had higher EC and transmission of light and lower PS and SD than those of the PES. Large size eggs had higher EC, SD, SV, transmission of light and egg physical dimensions than those of medium size eggs. It is concluded that genetic make up of birds and egg size influenced eggshell characteristics including EC and that, as a consequence, the difference in the spectral properties of eggshells. The pigmentation of eggshell influenced the amount and WL transmitted into the egg. The size and EC of eggs influenced the amount of light transmitted through the eggshell. EC is a good indicator for the ability of eggshell to transmit light. (*Asian-Aust. J. Anim. Sci.* 2002, Vol 15, No. 2 : 297-302)

Key Words : Egg Size, Shell Characteristics, Shell Pigmentation, Spectral Characteristics, Breeder Flocks
