

A comparison of fat-soluble antioxidants in wild and farm-reared egg yolk of chukar partridges (*Alectoris Chukar*)

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The Chukar partridge (*Alectoris chukar*) is a popular game bird that is closely related to the red-legged partridge *Alectoris rufa*. Its native distribution extends from the Balkans to eastern Asia. In Turkey, approximately 152,000 *Alectoris chukar* were released by the Ministry of Forestry and Water Affairs per annum between 2001-2011. Reared breeding of partridges for hunting purposes and in certain cases for supplementing wild populations are recognized as an important management tool. However, it is believed that the “quality” of reared gamebirds is more important than quantity. This study assessed differences in the composition of antioxidants (carotenoid, retinol, retinol-ester, vitamin E and coenzyme q₁₀) in egg yolks of *Alectoris chukar*. Wild partridge (*Alectoris chukar*) eggs were collected in 2013-2016, three eggs from eight different clutches (N = 24 eggs) during the breeding season (March-April) from the protected Karpaz Region of North Cyprus. Ten wild eggs were analyzed for antioxidants and 14 eggs were marked and incubated. Farm egg yolk samples were taken from Gönyeli Shooting and Hunting Partridge Farm. The farm capacity is 448 females and 168 male breeders. They were randomly distributed in 56 semi-open houses (4x3 m²) having 8 females and 3 males at each site. All breeders were 35 weeks old and they were fed a corn and soybean based diet. The eggs of each farm partridge were taken from ten different houses for antioxidant analyses and the rest of eggs were marked and incubated. All eggs were hatched in an artificial incubator under standard condition. Eggs were placed in an electric incubator with a dry bulb set at 37.2°C and automatic turning at 1 h intervals. Two days before hatching, eggs were transferred to a non-turning part of the incubator. On the day of hatch, 10 chicks from wild

and 10 randomly chosen chicks of farm origin were sacrificed by cervical dislocation. Chick tissues were dissected then transferred to a freezer (-56°C) until antioxidant analyses in the laboratory. This study was approved by the YYU Animal Ethics Committee (2016/09 decision number). Fat soluble antioxidant concentrations in egg yolks were determined by HPLC. Egg yolk fat soluble antioxidant concentrations of wild and farm-reared chukar was presented. These results showed that total carotenoid, total vitamin E, retinol and alpha-tocopherol in egg yolk were significantly higher in the wild partridges egg yolk (p<0.05). However, gamma-tocopherol, delta tocopherol and coenzyme Q10 were not significantly different in the eggs of either type of partridge (p>0.05). Individual carotenoid percentage of wild egg yolk was 4.54% unknown carotenoids, 87.43% (zeaxanthin + lutein), 0.64% β-cryptoxanthin and 7.39% β-carotene of total carotenoids, respectively. The percentage carotenoid profile for farmed partridge egg yolk was as follows: individual carotenoid percentage of total carotenoids in farmed egg yolk was close to that in farm feed with 96.80% (zeaxanthin + lutein) and 3.20% for unknown carotenes. Only β-carotene was not identified in egg yolk from farmed birds. These findings imply that the concentrations of fat soluble antioxidants in the eggs of reared Chukar partridges need to be revised and maternal access to antioxidants in the diet need to be increased.

Speaker Biography

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