

Synergistic effects of supplementation of dietary antioxidants during growth on adult phenotype in ring-necked pheasants, *Phasianus colchicus*.

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ABSTRACT

1. Oxidative stress may provide a proximate link between investment in growth and/or reproduction and investment in self-maintenance. Dietary antioxidants, such as carotenoids and vitamin E, provide potentially important roles in regulating these trade-offs. Recent work suggests that carotenoids may have synergistic effects in combination with non-pigmentary antioxidants (e.g. vitamin E) on the expression of sexually selected traits in adulthood. However, these studies involved the supplementation of antioxidants to adults so did not take account of early life-history effects.

2. Here, we test the independent and combined roles of supplementation of carotenoids and vitamin E during early growth in regulating the expression of traits in adulthood, in ring-necked pheasants, *Phasianus colchicus*. Individuals supplemented with a combination of carotenoids and vitamin E were larger at adulthood than individuals receiving other treatment diets (including vitamin E or carotenoids alone), but there were no differences in ornament expression, immune function, the swelling response to phytohaemagglutinin or levels of oxidative damage.

3. This shows that there are synergistic early life-history effects of these dietary antioxidants on body size at adulthood and suggest that the allocation of limited antioxidant resources are prioritized towards traits that increase competitive ability rather than sexual attractiveness in this strongly sexually selected species.

Citation

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