Marigold Petals and Tomato Fruit as Feed Additives to Improve Health Attributes of Quail Eggs

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Carotenoids are pigments that are important for eye, skin, and immune health. Eggs can be an important source of carotenoids in human diets, but yolk carotenoid content depends solely on carotenoids supplied by the bird's diet. The purpose of this experiment was to determine if supplementing Coturnix quail feed with 5% (by weight) dried, ground marigold petals or tomato fruits would increase egg yolk color and carotenoid content. Feed additives included orange and yellow marigolds, red tomatoes with high trans-lycopene, orange tomatoes with high beta-carotene, and yellow tomatoes with low carotenoids. Egg productivity was determined by measuring individual egg, yolk, albumin, and shell weights. Yolk color was measured using a yolk color fan, and carotenoid content of egg yolks was measured using high performance liquid chromatography (HPLC). Egg weights were not different between treatments. Yolk fan scores at 4 weeks were significantly higher in all treatments compared to the control, with the darkest yolks in the orange marigold and red tomato treatments. Lutein and zeaxanthin were increased in egg yolks from quail that were fed either yellow or orange marigolds, but levels were highest with orange marigolds. Beta-carotene and lycopene were increased in the egg yolks from quail fed the high beta-carotene and lycopene tomatoes, respectively. Marigold petals and tomato fruit feed additives resulted in the darker colored quail egg yolks that are preferred by consumers, and they also resulted in carotenoid increases that have benefits to human health.

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