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2021
https://hdl.handle.net/10539/32061

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Effect of dietary supplementation with *Hibiscus sabdariffa* calyces meal on broiler and egg laying quail (Coturnix coturnix japonica).

Abstract

The greatest concern of poultry producers is to reduce feed costs while meeting consumer expectations of safe, wholesome products. Poultry producers use synthetic feed additives to promote growth and feed utilisation efficiency as well as to improve health of the birds. There is an urgent need of replacing "synthetics" with natural plant-derived additives which are deemed safer in poultry production. This study sought to determine the effects of supplemental *Hibiscus sabdariffa* calyces meal on growth performance, health as well as meat and egg quality of Japanese quail. In the broiler study, a standard Japanese quail finisher diet was supplemented with *H sabdariffa* calyces meal at 0%, 5% and 10%: diets 1, 2 and 3, respectively. Seventy-five, 5-week old Japanese quail were randomly allocated to and fed the finisher diets for 28 days. Body mass and feed intake were determined and on slaughter, carcass yield, haematocrit, serum malondialdehyde concentration and plasma uric acid, total bilirubin, total protein, aspartate transferase (AST), albumin and globulin were measured. Meat physico-chemical quality was determined. In the pullet study, a standard Japanese quail layer diet was supplemented with *H. sabdariffa* calyces meal at 0%, 5% and 10%: diet1, 2 and 3, respectively. Ninety, 5-week old Japanese quail hens were randomly allocated to and fed the layer diets for 56 days. Body mass, feed intake and egg quality (egg mass, width and length, egg shell mass and thickness, yolk mass, height and diameter; albumen mass, length width and height, yolk and albumen proximate compositon as well as yolk fat content and fatty acid profiles) were determined and on slaughter, carcass yield, haematocrit, serum malondialdehyde concentration and plasma uric acid, total bilirubin, total protein, AST, albumin and globulin were measured. Meat physico-chemical quality was determined. There were no significant differences ($P > 0.05$) in the body weight gain of male and female Japanese quail kept for meat. Dietary *H. sabdariffa* calyces meal had no effect ($P > 0.05$) on the trial feed conversion ratio of female Japanese quail, but it significantly increased ($P< 0.05$) that of the male counterparts. Dietary *H. sabdariffa* calyces meal significantly reduced ($P = 0.0092$) the fat content of the thigh meat and increased ($P < 0.05$) the protein content of both breast and thigh meat of Japanese male quail. Supplemental *H. sabdariffa* calyces meal delayed the onset of laying and reduced ($P < 0.0001$) the number of eggs produced by Japanese quail. Supplemental *H. sabdariffa* calyces meal significantly reduced ($P < 0.05$) the shell thickness of Japanese quail eggs and increased ($P < 0.05$) the yolk fat and particularly

the saturated fat content. There were no significant differences ($P > 0.05$) in the feed conversion ratio and total body weight gain of layer Japanese quail. Dietary *H. sabdariffa* calyces meal reduced the meat's fat content thus can potentially be exploited to produce lean meat with better keeping quality. Supplemental *H. sabdariffa* calyces meal in layers may result in losses to the farmers and can compromise consumer health. Future studies should consider measuring bioavailability of the phytochemicals present in *H. sabdariffa* calyces meal.