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Nutritional and sensorial meat quality of different selected Japanese quails (*Coturnix coturnix japonica*)

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ABSTRACT

Descendants of S18 generation of Japanese quails (*Coturnix coturnix japonica*), selected for low (line 11, n=15) or high (line 12, n=6) yolk cholesterol content, egg type (line 13, n=15), and meat type (line 8, n=15) chosen as unselected control, were used for this experiment to study performance as well as nutritional and sensorial meat quality. The lowering of yolk cholesterol content in the line 11 was 313 mg/100 g yolk, and the increasing of yolk cholesterol content in the line 12 was 116 mg/100 g yolk, i.e. -17.25 %, and +6.39% in comparison to parental line 13, respectively. Quail-chicks were grown in a deep litter floor up to 35 days of age, under continuous lighting, with water and feed (a commercial diet) *ad libitum* until 12h before slaughtering, when feed was withdrawn. The body weight of the quails was controlled every week (from week 1 to 5). At the end of the experiment, all the birds were slaughtered (at avg. weight of 209.3a vs 104.0b, 107.7b and 110.6b g for lines 8, 11, 12 and 13, respectively; P<0.001) the hot carcass weight was recorded and dressing percentage was calculated. Pectoralis superficialis muscles were removed from the carcasses immediately after slaughter to assess intramuscular collagen (IMC) properties (collagen and crosslink concentrations), cholesterol and intramuscular lipid contents. For IMC analyses, muscles were trimmed of fat and epimysium, lyophilized, and hydrolyzed in 6N HCl for determination of hydroxyproline and hydroxylsypiridinoline (HLP) crosslinks, which are considered as main connective tissue components influencing meat tenderness. Intramuscular fat content was determined by histochemical method. The samples were cut in cryostat into 10_μm thick sections and stained by red oil method to differentiate intramuscular fat content. Multiscan v.14.02 Image Analysis System was used to define the intramuscular fat content. Data were submitted to one-way ANOVA. Quails of line 8 had the highest (P<0.01) growth and carcass weight (129.1 g) than those of the others lines. Dressing percentage was not affected (P>0.05) by different selection (ranging from 57.7 to 61.8%). The selection on yolk cholesterol content did not affect (P>0.05) the intramuscular lipid (1.48, 2.00, 1.76 and 2.54% for lines 8, 11, 12 and 13, respectively) and cholesterol muscle content (33.3, 27.8, 43.4 and 36.7 mg/100g lines 8, 11, 12 and 13, respectively). However, the meat of the quails selected for low cholesterol in the egg yolk (line 11) contained less cholesterol than that of the other birds, especially with respect to animals of line 12 (-35.9%), characterized by high cholesterol in the egg yolk. Collagen and muscle HLP concentrations (μg/mg) and the degree of collagen maturation, expressed as HLP crosslink (mol HPL/mol collagen), were not influenced by different selection. However the amount of collagen (ranging from 17.25 to 18.90 μg/mg) and crosslink (ranging from 0.141 to 0.175 mol HPL/mol collagen) found in the meat of this species if compared to those of poultry IMC are different. Results from the present study suggest, as expected, that quails of line 8 (meat type) showed better growth performance. Meat from Line 11 quails may be sensitive to less cholesterol content. In addition, considering the lower fiber collagen stability (mol HLP/mol collagen) found in this meat, we would expect a positive effect on meat tenderness.