

SELECTION ON YOLK CHOLESTEROL CONCENTRATION IN EGG TYPE HENS

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Summary

The egg type hybrid Shaver Starcross 288 was used as parental generation for selection. The criterion for selection was cholesterol concentration (mg/100g yolk) and was based on both family and individual records. The concentration of yolk cholesterol in parental generation was 1876 mg/100 fresh yolk. After three generation of selection, the concentration was significantly lowered as in father as in mother lines. In father line was yolk cholesterol concentration lowered from 1876 mg/ 100 g yolk to 1574 mg/ 100 g yolk, i.e. lowering of 302 mg/ 100 g yolk (16.10 %). In mother line was yolk cholesterol concentration lowered from 1876 mg/ 100 g yolk to 1521 mg/ 100 g yolk, i.e. lowering of 355 mg/ 100 g yolk (18.92 %).

Introduction

There has been a steady decline of egg consumption over the last two decades in highly developed countries. Hall and McKay (1992) reported that in Great Britain dropped the annual *per capita* consumption in Britain from a peak of 275 eggs in 1970, to 225 in 1986. A similar trend has also been reported in the United States where adverse publicity over the amount of cholesterol in eggs has been implicated as a cause for the decline (Reesman and Thorton, 1988). In spite of contradictory role of cholesterol in human nutrition is evident that the higher consumption of cholesterol in human diet has various negative influence on human health (Šobra 1996, Daniška 1998, Beňo 1999, Pospisilova 2000). Therefore the lowering of cholesterol in human diet is usefully. In our report we presented the first results of selection for lowering the cholesterol content in egg of egg-type hens.

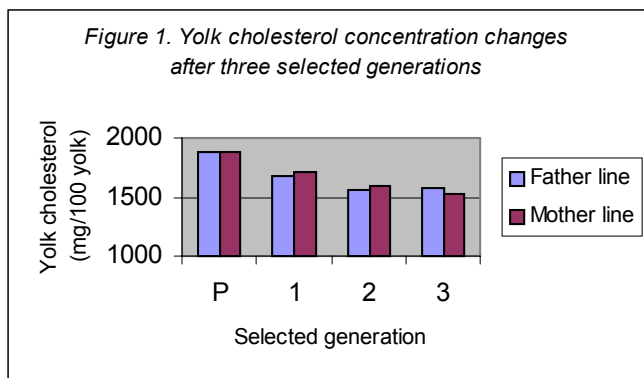
Materials and methods

The egg type hybrid Shaver Starcross 288 was used as parental generation for selection. The criterion for selections was cholesterol concentration (mg/100g yolk) and was based on both family and individual records. The cholesterol values were obtained 2 times from three consecutively laid eggs when the birds were about 30 and 36-40 weeks old. After measuring of egg weight and size and yolk weight a standard homogeneous sample of egg yolk was used from each quail layer for the chemical analysis. The yolk cholesterol concentration was estimated after enzymatic hydrolysis and oxidation (Cholesterol liquicolor test of Human Gesellschaft für Biochemica und Diagnostica mbH, Germany). The birds in rearing period 0 - 9 weeks received a grower ration for chickens HYD 04, in period 9 - 18 weeks HYD 05. After 18th week of age the hens were given diet containing 16 mg protein (NL) /kg. The metabolic energy (ME) in diet for adult hens was 11.0 MJ/ kg of diet.

Results

The influence of selection on egg yolk cholesterol concentration of hens after first three generation of selection is presented in Figure 1. The concentration of yolk cholesterol in parental generation was 1876 mg/100 fresh yolk. After three generation of selection, the concentration was significant lowered as in father as in mother lines. In father line was yolk cholesterol concentration lowered from 1876 mg/ 100 g yolk to 1574 mg/ 100 g yolk, i.e. lowering of 302 mg/ 100 g yolk (16.10 %). In mother line was yolk cholesterol concentration lowered from 1876 mg/ 100 g yolk to 1521 mg/ 100 g yolk, i.e. lowering of 355 mg/ 100 g yolk (18.92 %).

Our results confirm our selection findings in Japanese quail (Baumgartner et al. 1999, 2001), that the selection directed for lowering yolk cholesterol content may be successful both in hens as in quails.



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