

The Effect of Extruded Full-Fat Rapeseed on Productivity and Eggs Quality of Isa Brown Laying Hens

Authors : Vilma Sasyte, Vilma Viliene, Agila Dauksiene, Asta Raceviciute-Stupeliene, Romas Gruzauskas, Saulius Alijosius

Abstract : The eight-week feeding trial was conducted involving 27-wk-old Isa brown laying hens to study the effect of dry extrusion processing on partial reduction in total glucosinolates content of locally produced rapeseed and on productivity and eggs quality parameters of laying hens. Thirty-six hens were randomly assigned one of three treatments (CONTR, AERS and HERS), each comprising 12, individual caged layers. The main composition of the diets was the same, but extruded soya bean seed were replaced with 2.5% of the extruded rapeseed in the AERS group and 4.5 % in the HERS group. Rapeseed was extruded together with faba beans. Due to extrusion process the glucosinolates content was reduced by 7.83 $\mu\text{mol/g}$ of rapeseed. The results of conducted trial shows, that during all experimental period egg production parameters, such as the average feed intake (6529.17 vs. 6257 g/hen/14 day; $P < 0.05$) and laying intensity (94.35% vs. 89.29; $P < 0.05$) were statistically different for HERS and CONTR laying hens respectively. Only the feed conversion ratio to produce 1 kg of eggs, kg in AERS group was by 11 % lower compared to CONTR group ($P < 0.05$). By analysing the effect of extruded rapeseed on egg mass, the statistical differences between treatments were no determined. The dietary treatments did not affect egg weight, albumen height, haugh units, albumen and yolk pH. However, in the HERS group were get eggs with the more intensive yolk color, higher redness (a) and yellowness (b) values. The inclusion of full-fat extruded rapeseed had no effect on egg shell quality parameters, i.e. shell breaking strength, shell weight with and without coat and shell index, but in the experimental groups were get eggs with the thinner shell ($P < 0.05$). The internal egg quality analysis showed that with higher content of extruded rapeseed (4.5 %) level in the diet, the total cholesterol in the eggs yolk decreased by 1.92 mg/g in comparison with CONTR group ($P < 0.05$). Eggs laid by hens fed the diet containing 2.5% and 4.5% had increasing $\Sigma\text{PNRR}/\Sigma\text{SRR}$ ratio and decreasing $\Sigma(n-6)/\Sigma(n-3)$ ratio values of eggs yolk fatty acids than in CONTR group. Eggs of hens fed different amount of extruded rapeseed presented an n-6 : n-3 ratio changed from 5.17 to 4.71. The analysis of the relationship between hypocholesteremia/ hypercholesterolemia fatty acids (H/H), which is based on the functional properties of fatty acids, found that the value of it ratio is significant higher in laying hens fed diets supplemented with 4.5% extruded rapeseed than the CONTR group, demonstrating the positive effects of extruded rapeseed on egg quality. The results of trial confirmed that extruded full fat rapeseed to the 4.5% are suitable to replace soyabean in the compound feed of laying hens.

Keywords : egg quality, extruded full-fat rapeseed, laying hens, productivity

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