THE EFFECT OF OIL AND RAPE OIL MEAL USED IN LAYING HENS NUTRITION

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Abstract. The effect of using rape oil and meal in laying hens feeding was established on three groups of 27 laying hens from the Rosso SL hybrid each, with an initial age of 31 weeks, maintained in identical technological and microclimatic conditions and fed with isocaloric and isoproteic ratios. The difference in the forage structure consisted only in the substitution of sunflower oil with rape oil at the first experimental group and the sunflower meal with rape meal at the second experimental group. The productive effect of rape oil and rape meal was established on the basis of daily egg production and egg mass, egg size, the evolution of hen body weight. The nonsignificant and extremely reduced differences recorded for the control group show the high nutritional value of rape meal and oil meal, which can replace sunflower oil and meal in laying hens feeding.

Keywords: rape meal, laying hens, egg mass production

INTRODUCTION

Researches from the last years show that the rape meal, type canola, free of erucic acid and glycosinolates (00) has a biological value very close to that soybean meal (95%) and a higher content in methionine, hillock, sulphur, phosphor and calcium (Summers, 1985; Bell, 1988; Emmert, 1997).

Lowering erucic acid to level currently as low as 0,6% of total fatty acid composition has benefited edible oil products. The palatability of canola meal for livestock and poultry has been improved through reducing glucosinolate content, the fed intake for this forage became higher and like a consequence of this, the production obtained is also higher. Researchers have developed new processing methods which produce both a higher quality oil and superior protein products.

On the basis of all these aspects mentioned, we set as a goal for our investigations to determine the effect of replacement of sunflower oil and meal with spring rape oil and meal of the german Helga variety upon egg production at laying hens.

MATERIALS AND METHODS

The researchers were carried out on three groups of the Roso S.L. hybrid laying hens groups, of 31 weeks age, made up of 27 individuals randomly outcasted, were maintained in batteries (BP₃) in identical technological and climatic conditions. Their feeding was identical from the point of view of the energy-protein ratio, of the content in methionine and cysteine, calcium and phosphor and according to the nutritional requirements for the intensive exploitation of this hybrid. The forage administrated to the three groups was only structurally differentiated. In comparison with the control group, the sunflower oil was substitute with rape oil at Experimental - 1 group and the sunflower meal with rape meal at Experimental -2 groups.
The substitution was made progressively during the adjustment stage, from 5 to 5 days. The forage quantity for all groups was 130g/hen/day for the first 52 days and 120g/hen/day for the next 111 days. All groups received a mineral supplement of calcium carbonate and monocalcium phosphate administrated ad libitum.

During the entire trial, we followed and recorded, at all groups, daily the egg production, the egg weight, the morbidity and the mortality and twice a week the individual egg weight. At the beginning, at the middle and at the end of the trail we determined the individual hen body weight.

RESULTS AND DISCUSSIONS

The development of daily egg production, displayed in table 1, shows for all groups an encouraging constant during the trial. The laying frequency for the control group were between 90,44% for the adjustment stage and 76,74% for the 5-th control month. For the experimental-1 group, the laying frequency recorded values between 91,07 % and 77,07% For the second Experimental group, the values was between 90,11% for the adjustment stage and 77,44% in the 5-th control month.

In comparison with control group, the daily egg production is practically the same for all groups. The statistics analysis by Student test showed that the differences recorded at all groups are no significant. The daily egg mass production shows an evolution similar to the daily egg production. The differences recorded were very reduced, significant only between control and the second experimental groups.

Table 1.

<table>
<thead>
<tr>
<th>Item</th>
<th>Control group (C)</th>
<th>Experimental-1 group (E₁)</th>
<th>Experimental-2 group (E₂)</th>
<th>Differences significances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X ± sx</td>
<td>V%</td>
<td>X ± sx</td>
<td>V%</td>
</tr>
<tr>
<td>The daily egg production</td>
<td>22,73±0,185</td>
<td>8,02</td>
<td>22,84±0,059</td>
<td>4,51</td>
</tr>
<tr>
<td>Daily egg mass production</td>
<td>1,436±0,018</td>
<td>8,25</td>
<td>1,410±0,012</td>
<td>8,37</td>
</tr>
<tr>
<td>Egg weight –gr-</td>
<td>61,92±0,181</td>
<td>8,68</td>
<td>60,37±0,570</td>
<td>11,83</td>
</tr>
</tbody>
</table>

Another aspect of egg production taken under study was the egg weight, gravimetrically established. The data recorded, show a characteristically evolution for this feature.

The average egg weight increased at all groups during the trial; for control group with 6.05 %, for the experimental-1 group with 3.70 % and for the experimental-2 group, with 5.21 %. During the experimental stage, the values recorded for E-1 group are very close of control group the differences recorded are no significant.

Compared on groups, a higher average egg weight was recorded at the experimental stage. During the experimental stage, the differences values recorded between control and E-1 groups were 1.55 g and between control and E-2 groups were 1.06 g., the differences recorded are no significant.
From the analysis of the data regarding hen body weight one can conclude on the one hand, that the average values for all groups are situated between the limits of the standard hybrid and on the other hand, that during the trial the evolution was normal for this feature (table 2).

Table 2.

<table>
<thead>
<tr>
<th>The stage</th>
<th>Control group (C)</th>
<th>Experimental-1 group (E1)</th>
<th>Experimental-2 group (E2)</th>
<th>The differences significances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X ± sx V%</td>
<td>X ± sx V%</td>
<td>X ± sx V%</td>
<td>C-E1 -t-</td>
</tr>
<tr>
<td>Initial</td>
<td>1,893±0,046</td>
<td>1,945±0,035</td>
<td>1,905±0,031</td>
<td>0,634</td>
</tr>
<tr>
<td>Final</td>
<td>2,175±0,042</td>
<td>2,119±0,046</td>
<td>2,189±0,040</td>
<td>0,500</td>
</tr>
</tbody>
</table>

The differences recorded between the groups, during the trial, are statistically no significant. The evolution of body weight, which was similar for all groups, demonstrates that the substitution of sunflower meal with rape meal did not influence significantly hen body weight during the entire trial.

CONCLUSION

1. The daily egg production, the laying curve, the daily mass egg, the egg weight and the evolution of body weight demonstrates that the substitution of sunflower oil and meal with rape oil and meal did not influence significantly these features.

2. The slightly lower values of the productive indices studied (1.9% for the egg number, 4.45% for the egg mass production and 1,71% for the egg weight) recorded for the second experimental group show however the presence of a lightly depressive effect that rape meal has upon the thyroid gland function.

3. The no significant and extremely reduced differences recorded show the high nutritional value of rape oil and meal, which can replace sunflower oil and meal in laying hens feeding.

REFERENCES

4. XXX, Animal Feed Resources Information System. (2003). Canola meal, Rapeseeds meal, 00-Rapeseed, 0-Rapeseed