

RESEARCHES CONCERNING THE USAGE OF WHOLE SUNFLOWER SEEDS IN POULTRY FEEDING

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Abstract

During last years, an especially attention was focused on the usage of certain unprocessed "raw matters" in poultry feeding, in order to cu processing costs. The classical technology supposes the adding of fats, in order to balance the energetic level of the mixed fodders, involving thus major expenses to extract the fats from seeds and to incorporate them in feed. These inconvenient could be avoided by the usage of the whole raw matters, which give more advantages than the by-products obtained after the fats extraction. Consequently, an experiment has been set up, using 4 groups of chickens, fed with various proportions of whole decorticated sunflower seeds into the feed. The results have been compared with those registered by a control group, fed with classical mixed fodder. The usage of decorticated sunflower seed in chickens feeding generated higher body weights values (+3.37...+4.74%), compared to the control group. The groups which received also undecorticated sunflower seeds achieved average live weight closely to the control group (0.66% lower and 0.05% higher, as well). The average daily weight gain evolved in accordance with the fowl growing speed. The average feed intake/chicken was 1.15 – 7.69% higher in the experimental groups than that measured in the control group. Feed conversion ratio has been influenced by the crude fiber content in feed. Feed conversion varied with +1.80%...- 1.33% in the groups fed with decorticated seeds, compared with the control. Flock losses reached 3.6%, value considered as normal. Better economic results (+6.79%...+7.59%) have been achieved by the groups fed exclusively with sunflower seeds. Considering the achieved results, it could be recommended to use the whole decorticated sunflower seeds in chickens feeding, as a valuable and natural energy source, in proportions varying between 5 to 21% in the feed structure.

Key words: poultry, sunflower seeds, mixed fodder, energy, efficiency

INTRODUCTION

In monogastric animals, feeding technology comprises the addition of fats, in order to balance the energy level of the mixed feed, as requested by the poultry requirements. In this case, certain expenses should be done twice, first - to extract fats from the raw matters, then to incorporate them into the mixed feed.

This inconvenient could be avoided by the usage of the soybean and sunflower whole seeds, after their conditioning with treatments which should allow their usage with maximum efficiency.

Several researches focused worldwide on the feeding of some unprocessed raw matter to poultry, such as cereal grains, leguminous

and oleaginous seeds (soybean, sunflower) in order to cut from processing (oil extraction), transportation and storage costs. Our research belongs to the same scientific mainstream, having as main goal the assessments of the productive effects generated by the usage of the decorticated or undecorticated sunflower seeds into the poultry mixed feed recipe.

MATERIALS AND METHODS

The experiment has been carried out into the Microfarm of the University of Agricultural Sciences and Veterinary Medicine, Iași city, Romania, using a flock of 250 Ross 308 broiler chickens, randomly allocated in five groups, meaning: a control

group (LM) and four experimental treatments (LE₁ LE₂, LE₃ and LE₄).

In the control group, the chickens feed did not include sunflower seeds. At the chickens from the LE₁ and LE₂ groups, decorticated sunflower seeds have been included in feed, at the LE₁ treatment from the grower recipe and at the LE₂ group, since the very first day of life. In the LE₃ and LE₄ groups, mixed feed including undecorticated sunflower seeds has been used: starting from

11 days old in LE₃ group; decorticated seeds during starter period (1-10 days) and undecorticated sunflower seeds till slaughtering, in the LE₄ group (tab. 1).

Accommodation of the "Ross 308" broilers has been done using BP-4 pyramidal cage batteries (4 levels) till the age of 42 days, the following parameters being studied across this period: body weight dynamics, daily feed intake, flock casualties (capitis, %) and economic efficacy.

Table 1. Experimental design

Group	Flock size (capitis)	Chickens age		
		1-10 days	11-24 days	25-42 days
LM	50	M.F.*	M.F.*	M.F.*
LE1	50	M.F.*	M.F.* with 2.5% decorticated sunflower seeds and 7% full fat soybean	M.F.* with 9% decorticated sunflower seeds
LE2	50	M.F.* with 5.5% decorticated sunflower seeds	M.F.* with 2.5% decorticated sunflower seeds and 7% full fat soybean	M.F.* with 10% decorticated sunflower seeds
LE3	50	M.F.*	M.F.* with 2.5% decorticated 7.5% undecorticated sunflower seeds	M.F.* with 8.5% undecorticated sunflower seeds
LE4	50	M.F.* with 5.5% decorticated sunflower seeds	M.F.* with 7.5% decorticated 2.5% undecorticated sunflower seeds	M.F.* with 8% undecorticated sunflower seeds

Notice: * mixed feed commonly used for each technological period

RESULTS AND DISCUSSIONS

Assessment of the growing dynamics has been run individually, weekly, for the entire flock.

During brooding day, the body weight was measured between 38.55-39.02 g/chicken. Groups homogeneity was quite good, knowing that the variability was situated below 5% in the experimental groups.

At one week old, during the second weighting, close values were found for the body weight of the chickens in the five groups, without any occurrence of statistic significance between differences. The achieved values were comprised between 131.30 g in group LE₃ and 132.66 g in group LE₁.

At the age of 14 days, it was found that the chickens in the LM group had an average live weight of 344.79±1.74 g, close to those measured for the experimental groups (338.72-349.20 g). No statistical significance

occurred for the differences between groups, while the homogeneity was quite good.

During the 4th weighting, corresponding to the 21 days age, statistical significant weight differences did not occur between the experimental and control groups. When the chickens reached three weeks old, the average values of the body weight were found between the limits of 559.97±11.82 g in LE₂ group and 569.06±11.82 g in LE₃ group, while in the LM group they reached 563.81±10.24 g.

Groups homogeneity was considered in the middle range (V%>10), except for the LE₁ group, which had well variability (V%<10).

At 28 days, the LE₁ group reached and average weight of 896.67 g/chicken, being just 1.5% higher than that observed in LM group (878.64 g/chicken). Concerning the experimental groups LE₁ and LE₄, the achieved values were slightly higher than that of the LM group (+0.36...0.97%). The LE₃

group reached a weight of 875.73 ± 10.78 g, meaning 0.33% lower than that of the LM group the differences were not significant, while groups homogeneity was considered as very good ($V\% = 5.97 - 7.38\%$).

At 35 days old, the chickens in the LM group reached a body weight of 1285.80 g/chicken in LE_1 , LE_2 and LE_4 groups being slightly higher (+0.1...+3.66%). In LE_3 group, the average body weight was 0.85% lower than that recorded in the LM group. No statistically significant difference occurred between the five experimental groups.

For LE_1 and LE_3 groups, the variability reached values under 10% (8.68-9.85), while for the other groups it passed over (LM, LE_2 and LE_4), with values comprised between 10.98-13.12, suggesting thus middle range variability.

When chicken turned 42 days old, the differences concerning growing and weight gain were between the experimental groups LE_1 ; LE_2 ; LE_4 and the control one were comprised between 0.05 – 4.71% (higher in the experimental treatments), while in the

LE_3 group, the average body weight reached 1707.5 g, lower with 0.66% than that of the LM group.

The differences occurred between experimental and control groups were not significant. The variability was quite low in the LE_3 group (less than 10%), while in the other groups it reached middle range values, comprised between 10.81 – 12.11%.

At the experiment closure, corresponding to the chickens age of 42 days, when they were slaughtered, the cumulated weight gain was 0.05-4.86% higher in the experimental groups LE_1 , LE_2 and LE_4 , compared to the LM group. The highest value of the weight gain (cumulated) was found in LE_2 group, meaning 1761.76 g vs. 1680.04 g in LM_1 group, while the lowest value for the same trait was observed in LE_3 group, with a value of 1668.90 g, respectively 0.66% less than in the LM group (fig. 1).

In the control group (LM) the average daily gain reached 40 g, while for the other groups was calculated at 41.39 g - LE_1 ; 41.94 g - LE_2 ; 39.73 g - LE_3 and 40.02 g - LE_4 .

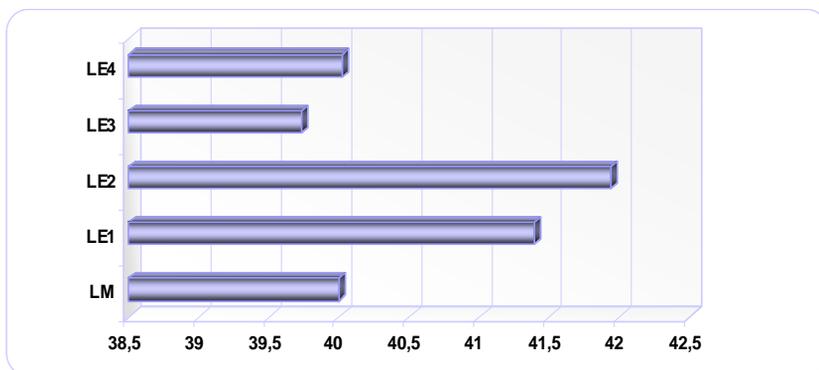


Fig. 1. Average daily gain of the chickens, expressed across the entire growing period

Feed intake. The feed conversion ratio has been significantly influenced by the feed concentration in gross fiber. The groups fed with undecorticated sunflower seeds had a FCR value higher than those calculated for the other groups. Higher feed intake values (assessed on daily and cumulated basis) were observed in all experimental groups (LE_1 , LE_2 , LE_3 and LE_4), comparing to the control group (LM).

At the age of 7 days, the cumulated feed consumption reached 126 g in LM group, it was comprised between 131-136 g at the experimental groups LE_2 , LE_3 and LE_4 and reached 125 g in LE_1 group.

After 21 days of life, the chickens in the experimental groups consumed (cumulated) 4.76-8.65% more feed than those in the control group, while at 35 days old, the

cumulated consumption was also higher, meaning +2.28...+8.02%.

At 42 days, the cumulated feed intake of the control group was 1.58-7.69% lower, compared to the values calculated at the experimental groups.

Concerning the feed conversion rate (FCR), it was found that better values

occurred in the groups fed with decorticated sunflower seeds added in fodder, being thus close to those obtained in LM (-1.80% in LE₁ and +1.35% in LE₂). The chickens fed with mixed feed added with undecorticated sunflower seeds achieved a lower feed conversion ratio, meaning 7.65% and 8.10% less than LM (tab. 3).

Table 3. Feed conversion ratio

Groups	Total gain (kg/cap)	Cumulated consumption (kg/lot)	Average feed consumption (kg/cap)	Feed conversion (kg feed*/kg gain)	±% compared to LM ₁
LM	1.680	179.10	3.730	2.22	-
LE ₁	1.738	181.10	3.789	2.18	- 1.80
LE ₂	1.761	194.20	3.962	2.25	+ 1.35
LE ₃	1.668	188.20	4.003	2.40	+ 8.10
LE ₄	1.681	196.90	4.017	2.39	+ 7.65

Notice: * mixed feed

Flock casualties. Across the experimental period, the recorded flock casualties have been comprised within the normal limits (maximum 4%). The usage of sunflower seeds, either decorticated or undecorticated, did not influence the casualties level.

The economic efficiency has been analyzed basing on expenses, revenues and other economic results for each of the five

chickens groups. The achieved data (fig. 2) show that the LE₁, LE₂ and LE₄ groups generated higher revenues than the control group, meaning + 7.59% in LE₁ group, + 6.79% in LE₂ group and +3.22% in LE₄ group. Lower revenue has been recorded in LE₃ group (-8%), compared to the control group (LM).

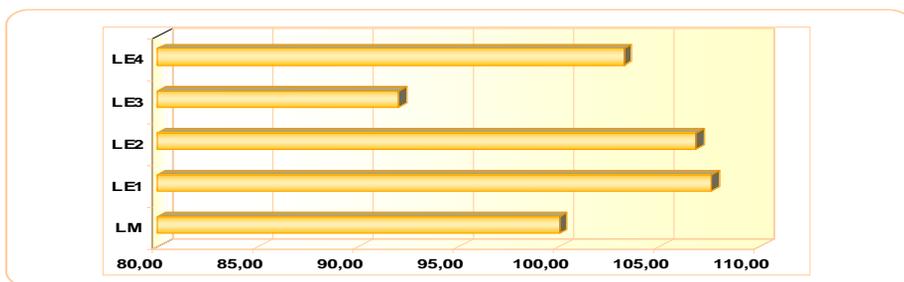


Fig. 2. Economic results achieved by the chicken broilers groups (%)

CONCLUSIONS

1. The usage of decorticated sunflower seeds in chicken broilers proved to be beneficial. In the experimental groups fed exclusively with decorticated sunflower seeds, 3.37 – 4.74% higher body weights have been achieved, compared to the control group, while in those groups fed also with undecorticated seeds, the live weights were sensibly equal to those obtained in the

control group. The average daily weight gain evolved in accordance with the chickens growing speed.

2. Average daily feed intake/chicken was 1.15 – 7.69% higher in the experimental groups, compared to the control one.

In the experimental groups, the feed conversion rate was lower with 1.33 – 8.1% than in the control group (excepted for the LE₁ group, whose feed conversion ratio was

1.80% higher), the values being straightly correlated to the crude fiber content of the feed.

3. Total casualties in the flock reached 3.6%, value comprised within the normal limits specified by the management guide (4%).

4. In those experimental groups fed with exclusively decorticated sunflower seeds, best economic performances were recorded, meaning 6.79 – 7.59% better than those achieved by the fowl in the control group.

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