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THE STUDY OF THE ECONOMIC EFFICIENCY IN AMINO-ACIDS SUPPLEMENTATION OF THE LAYING HEN`S FODDER

EVALUAREA EFICIENŢEI ECONOMICE A SUPLIMENTĂRII CU AMINOACIZI SINTETICI A FURAJELOR COMBINATE PENTRU GĂINI OUĂTOARE

SIMIZ ELIZA*, DRIHA ANA*, DRINCEANU D.*
**Faculty of Animal Sciences and Biotechnologies, Timişoara, România*

The experiment has been carried out on 69 Tetra SL hens, 27-36 weeks old, distributed into 3 groups consisted of 23 hens. They were fed with fodder recipes with different protein levels (17, 16 and respectively 15%). These recipes have been supplemented with DL-methionine and L-lysine up to the level of 0.80% lysine and 0.38% methionine. Fish flour has participated in a proportion of 3% in group 1, 1.5% in group 2 and it was absent from the fodder structure used in group 3. The reduction of crude protein with 1-2p% compared to the available commercial products, but with an amino acid supplementation, has led to the improvement of the economic criteria regarding egg production, generating savings of 7.7% in the group with 16% CP and of 12.8% in the group with 15% CP. The egg mass has not been affected significantly (p>0.05), the best yield being achieved from the hens fed with a 16%CP recipe.
Key words: laying hens, protein level, amino acids, economic efficiency

Introduction

Feed protein level represents one of the limitative nutritive elements, as source and price, in all animal categories. The amino acid supplementation of the combined feeds for hens has a practical importance due to the reduced cost provided by the partial replacement of the expensive or rare protein ingredients. Fodder supplementation with very small amounts of essential limitative amino acids (methionine and lysine) for the formulation of some complete, well-balanced and advantageous recipes may increase significantly their nutritive value.

Materials and Methods

Our researches have been performed at the Poultry Department from the Didactic Station of BUASVM Timisoara, on 69 hybrid Tetra SL hens, 27-36 weeks old. The birds have been distributed into three experimental groups, each one being consisted of 23 hens. In this experiment, we have used three fodder recipes (for the three groups), differentiated through their crude protein percentages (17, 16, respectively 15%); the amino acid level was maintained according to the NRC recommendations (1994) (lysine 0.80% and methionine 0.38%), by supplementing

the combined fodder with different per cents of synthetic amino acids. The structure of the combined fodder used within this experiment was consisted of almost the same ingredients, excepting fish flour. It was totally absent from the group with 15% CP, but it has participated in a proportion of 3% in the group with 17% CP and of 1% in the group with 16% CP (Table 1). The results achieved were statistically processed and compared to each other with the help of the test Mann Whitney.

Table 1

Experimental organization scheme

Specification		Experimental variants		
		1 (17% CP)	2 (16% CP)	3 (15% CP)
Level of assured AA (%)	Methionine	0.316	0.292	0.262
	Lysine	0.850	0.778	0.720
Level of supplemented AA (%)	DL-methionine	0.064	0.088	0.118
	Lysine	-	0.032	0.09
Fodder nutritive characteristics				
EM (kcal)		2835	2850	2838
CP (%)		17.03	16.05	15.04
Methionine (%)		0.38	0.81	0.81
Lysine (%)		0.85	0.38	0.38

Results and Discussions

SAFAR and ROSE (2002) consider that 70% of the egg production costs represent expenses for fodders. Relying upon this statement, we have kept the evidence with all expenses recorded for fodder, along our experiment, in order to establish the price of the fodder consumed by each group and to calculate the feeding cost/kg egg production weight.

The combined fodder intake recorded during the 10 experimental weeks was: 188.21 kg in group 1, 196.09 kg in group 2 and 183.71 kg in group 3; the egg mass achieved was 1.05-1.16 kg (Table 2).

Table 2

Statistical indices of the egg mass (kg/group/week) achieved from the Tetra SL hens

Statistical indices	Experimental group		
	1 (17% CP)	2 (16% CP)	3 (%CP)
n	10	10	10
$\bar{x} \pm S\bar{x}$	1.11±0.04 [a]	1.16±0.03 [a]	1.05±0.05 [a]
S	0.11	0.08	0.15
CV%	10.18	6.89	14.14

The data presented in the above table show a reduction with 16, respectively 15% CP, in the case of the amino acid supplementation, did not affect negatively the laying performances ($p>0.05$).

Table 3 presents, both the price of the combined fodder used in this experiment, and the expenses made for fodders/kg egg mass, for the three experimental groups.

Table 3

Combined fodder price (€) and expenses required by poultry feeding in this experiment

Specification	Combined fodder price		Feeding expenses	
	€/to	%	€/kg egg mass	%
Group 1	161.37	100	0.39	100
Group 2	148	91.71	0.36	92.30
Group 3	138.29	85.69	0.34	87.18

The data presented in the above table lead to the conclusion that group 3, which consumed a CF with 15% CP, has recorded the lowest feeding costs, being followed by group 2 (16% CP); this cost decrease/t CM is given by the reduced proportion of animal-based fodder participation (fish meal) in group 2 and by its absence from the structure of the combined fodder in group 3.

We may remark the fact that, by supplementing lysine and/or methionine in order to assure constant amino acid levels, we have not increased the price for the combined fodder in groups 2 and 3. The price of the CF administrated to hens from group 3 represents only 85.69% of the value of the fodder administrated in groups 1; the fodder administrated in group 2 represent 91.71%.

So, food costs have decreased with 14.3% (23.08 euro/t) in group 3 and with 8.28% (13.37 euro/t) in group 2, by reducing the protein levels with up to two percentage points (Figure 1).

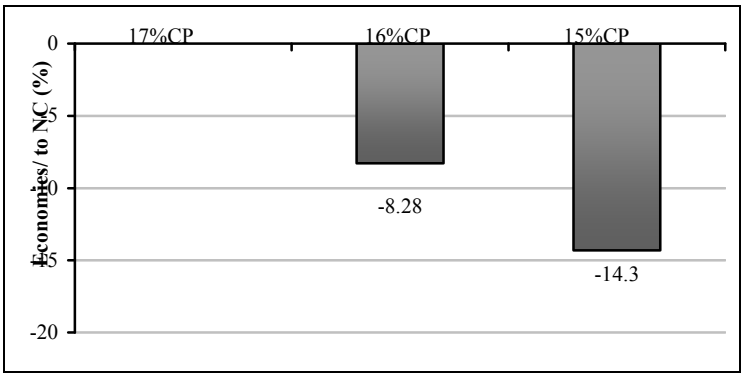

Figure 1 Saving of fodder costs recorded in Tetra SL hens (/to)

Table 3 leads to the conclusion that group 3 has recorded the most reduced cost/kg egg mass (0.34 euro), while group 1 (with a CF containing 17% CP and with a fish meal amount of 3%) has recorded higher fodder costs/kg egg mass (0.39 euro).

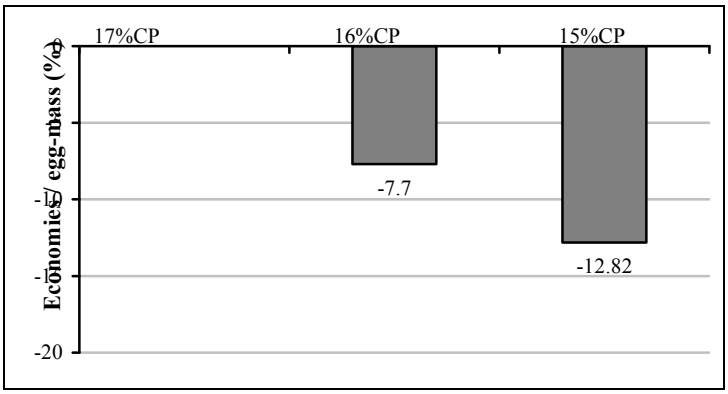

Figure 2. Savings registered for fodder costs/egg mass in Tetra SL hens according to low protein diets and with amino-acids supplements

Analyzing Figure 2, we may conclude that, with regard to the egg mass, the feeding costs were 7.7% for group 2 and 12.8% for group 3, compared to the group which has consumed a CP with 17% CP.

Conclusions

- The highest fodder intake during the entire experimental period was achieved in group 3 (196.09 kg), being followed by group 1 (188.21 kg) and group 2 (183.71 kg), leading to an average daily intake of 0.122 kg in group 3, 0.117 kg in group 1 and 0.114 kg in group 2, concordant with the limits mentioned within the technological guide of this hybrid (0.115-0.125 kg).

- The highest egg mass (a mean of 1.16 kg per week) was achieved from the hens which were fed with the recipe with 16.03% CP, 0.81% lysine and 0.38% methionine (group 3), being followed by group 1 (1.11 kg) and group 2 (1.05 kg) – which was fed with the recipe containing the lowest protein level (15.03%).

- The decrease of crude protein compared to the industrial standard has led to the improvement of the economic criteria related to egg production; so the savings for fodder costs were 7.7% for the recipe with a protein level reduced with 1p% and 12.8% for the recipe containing a protein level reduced with 2p%, compared to the group which was fed with a CF with 17% CP.

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SIMIZ ELIZA*, DRIHA ANA*, DRINCEANU D.*

**Facultatea de Zootehnie şi Biotehnologii, Timişoara, România*

Experimentul a fost efectuat pe 69 găini Tetra SL, în perioada de vârstă 27-36 săpt. Au fost constituite 3 loturi a câte 23 găini, cărora li s-au administrat reţete furajere cu nivel proteic diferenţiat (17, 16 şi respectiv 15%). Reţetele au fost suplimentate cu DL-metionină şi L-lizină până la nivelul de 0,80% lizină şi 0,38% metionină. Făina de peşte a participat în proporţie de 3% la lotul 1, 1,5% la lotul 2 şi a lipsit din structura nutreţului combinat utilizat la lotul 3. O reducere a proteinei brute cu 1-2p% faţă de nivelurile utilizate în preparatele comerciale prezente pe piaţă, dar cu condiţia suplimentării aminoacizilor a condus la o îmbunătăţire a criteriilor economice legate direct de producţia de ouă, rezultând o economie de 7,7% la lotul cu 16% PB şi de 12,8% la lotul cu 15% PB. Nu a fost afectată semnificativ (p>0,05) cantitatea masă-ou produsă, cea mai bună producţie fiind înregistrată la găinile care au consumat o reţetă cu 16% PB.

Cuvinte cheie: găini ouătoare, nivel proteic, amino acizi, eficienţă economică