THE INFLUENCE OF SOME MACROCOMPONENTES FROM BROILER FOOD ON A FEW BIOCHEMICAL METABOLIC INDICES

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Abstract

To reduce the import of soy oil cake, which requires a significant financial effort, it is necessary to research opportunities for its partial replacement in broilers feeding with native protein sources, respectively sunflower oil cake, in the context of using small amounts of synthetic aminoacids or fish meal. The researches were conducted using groups' method. There were organized four groups (lots). The first lot - L1 (M) - was considered the control lot; in this lot it has been used only soy oil cake as protein fodder. On other lots, some soy oil cake was replaced with sunflower oil cake in different proportions or sunflower oil cake and fish meal, and to ensure the biological value of the protein it has been used different proportions of synthetic aminoacids (lysine and methionine). Investigated sanguine biochemical indices (total protein, total fat, cholesterol, glucose, GOT, GPT, LDH, urea, uric acid) confer higher metabolic advantages in broilers fed only using soy oil cake or in those for which soy oil cake was replaced with sunflower oil cake and fish meal.

Key words: broiler, soy oil cake, sunflower oil cake, sanguine biochemical indices

In the last years, researchers are concerned with finding new nutritional solutions regard poultry feeding, solutions that allow achieving high production performance with minimized cost and effort.

Although it is considered a strategic fodder raw material, in many countries in Europe and Asia, soybean oil cake is imported, fact which requires finding alternative vegetable protein sources. This phenomenon is also true for our country, which covers about 30% of the needs from indigenous production (Burciu, D, 2001).

MATERIAL AND METHOD

The biological material was represented by the "Ross 308" broiler hybrid. The experiments were performed on four lots of broilers by 40 head / lot. It was selected one control group and the other lots were considered experimental groups:

- in the control lot L1 (M) it was used only oil cake of soy as protein fodder;
- - in L2 lot, besides soy oil cake there were introduced in fodder sunflower oil cake at a rate of 7% (% by weight of mixed fodder) and synthetic aminoacids (lysine and methionine);
- - in L3 lot , in addition to soy oil cake there was used in fodder sunflower oil cake at a rate of 12% (% by weight of mixed fodder) and synthetic aminoacids (lysine and methionine);
- - in L4 lot, besides soy oil cake, there were introduced in fodder sunflower oil cake at a rate of 7%, fish meal 2% and synthetic aminoacids (lysine and methionine).

To determine the major biochemical indices there have been harvested 8 samples per group (4 roosters + 4 hens) in the last day of the experimental period, at the age of 42 days.

To avoid any distortion process of the individual samples there has been used were used appropriate instruments and containers, sterilized and hermetically sealed (the "vacutainer"). Blood samples were collected individually, but for economic reasons, for the chemical analysis there were formed two average samples for each lot: one for roosters and one for hens.

RESULTS AND DISCUSSIONS

Values obtained by performing laboratory analysis are presented as the average mix of roosters and hens *(tab. 1)*.

Following compared biochemical indices from the experimental lots, caught in the last experimental day, firstly there can be found relatively close values recorded by broilers from lot 1 (M) in which soy oil cake was used as the only protein feed and those in lot 4, where sunflower oil cake (7%) and fishmeal (2%) was added.

Table 1

Biochemical sanguine indices registered in broilers at the end of the experimental period (42 days)

Specification	M. U.	Experimental lots			
		L 1 (M)	L 2	L 3	L 4
Total Proteins	g/100 ml	3.02	3.07	3.22	3.36
	%	100.00	101.65	106.62	111.25
Total Lipids	mg/100 ml	924.5	942.5	1047.5	895.0
	%	100.00	101.95	113.30	96.81
Cholesterol	mg/100 ml	113.5	108.0	116.0	112.0
	%	100.00	95.15	102.20	98.68
Glucose	mg/100 ml	152.4	160.5	169.5	143.0
	%	100.00	105.31	111.22	93.83
G.O.T.	U.I./l	21.35	16.20	15.3	28.90
	%	100.00	75.88	71.66	135.36
G.P.T.	U.I./l	5.72	5.04	5.12	6.9
	%	100.00	88.11	89.51	120.63
L.D.H.	U.I./l	402.5	427.0	422.0	405.5
	%	100.00	106.08	104.84	100.74
Urea	mg/100 ml	3.11	3.90	4.64	3.69
	%	100.00	125.40	149.2	118.65
Uric acid	mg/100 ml	5.66	6.28	6.69	5.87
	%	100.00	110.95	118.20	3.71

Compared to broilers in lot 1 (M), those in lots 2 and 3, which had added in their food sunflower oil cake at a rate of 7% and, respectively, 12%, the total protein level did not differenced much, but urea and uric acid (products of protein catabolism) levels increased. This suggests that for broilers of lots 2 and 3 there was an imbalance of amino acids in food, so some of them were deaminated and used as energy source in the body.

Increased glucose for broilers in lots 2 and 3 compared to lot 1 (M), together with increased levels of LDH (***Lactate dehydrogenase***) and of urea and uric acid from blood lead to the same conclusion: intensification of oxidation processes in the body and of using protein for energy purposes. This conclusion is confirmed by higher levels of glucose and lipids in the blood, for broilers in lots 2 and 3 compared to those in lot 1 (M).

Also, concomitantly to these changes there was a decrease in the level of GPT (Glutamate Pyruvate Transaminase) and GOT (Glutamate Oxaloacetate Transaminase), which means a reduction in intensity of transmethylation processes, respectively of the amino acids formation necessary for synthesis of tissue.

In fact, these lots average daily weight gain was lower than in broilers from lot 1 (M).

This variation of the main biochemical indices shows that the biological value of protein in broilers food from lots 2 and 3, where sunflower oil cake was added, was lower, respectively the level and the relationships established between essential amino acids were lower then those insured to feed broilers in lot 1 (M), where there has been used only soy as protein fodder.

Compared to broilers in lot 1 (M), those in lot 4, where sunflower oil cake and fish meal were introduced in food , the glucose, urea, uric acid and LDH blood levels were not changed substantially, suggesting that fish meal contributed to finishing the biological value of protein food, which is used more efficiently in tissue synthesis.

Mean main biochemical indices suggest, in general, acceleration of tissue synthesis and efficient use of protein feed for broilers in lots 1 (M) and 4, compared with those in lots 2 and 3. Thus, investigated metabolic indices confer greater metabolic benefits for broilers in lot 1 (M) and lot 4, which explains scientifically better results bio-productive effect obtained by them than those of other lots (*fig. 1 a, b*).

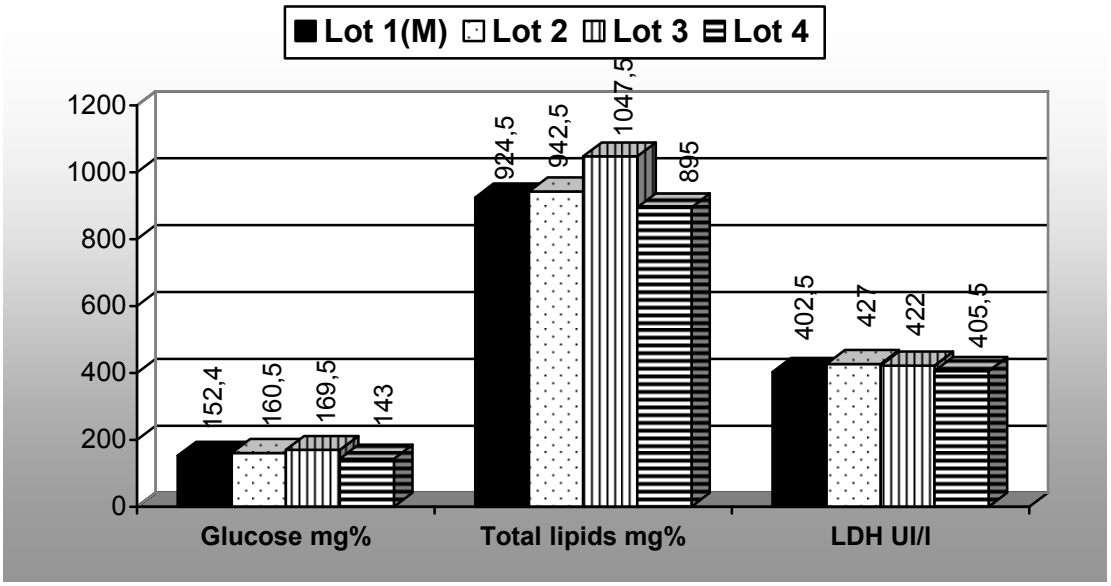

Figure 1a **Changes in biochemical indices from the last day of the experimental period (42 days)**

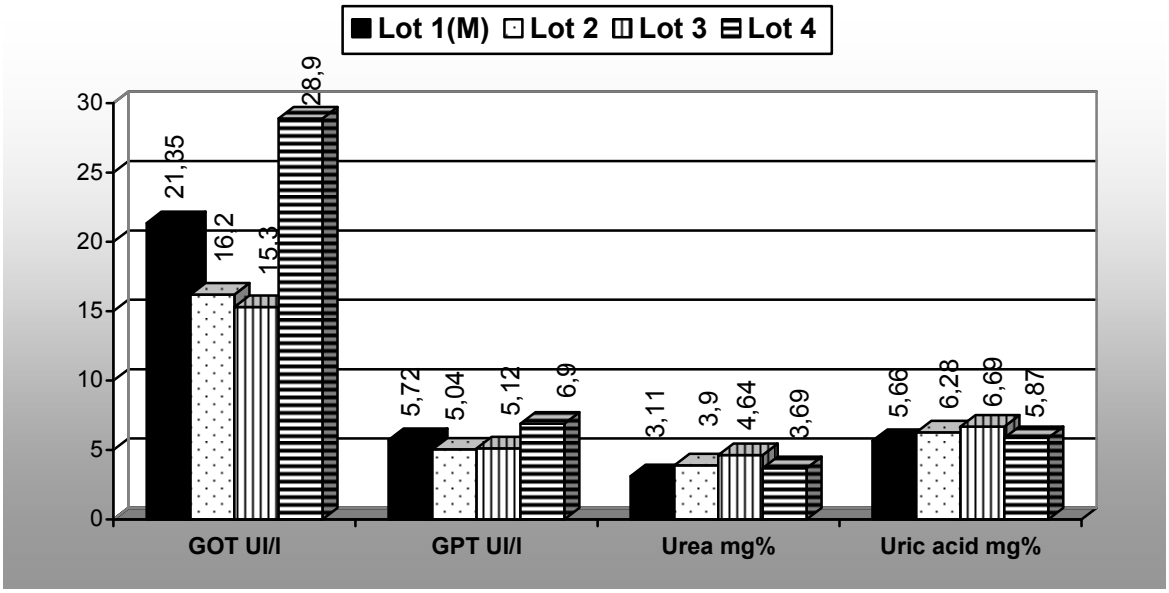

Figure1b **Changes in biochemical indices from the last day of the experimental period (42 days)**

CONCLUSIONS

Biochemical indices registered on the last day of the experimental period (42 days) fell within the physiological limits cited in the literature.

Mean main biochemical indices suggest, in general, acceleration of tissue synthesis and efficient use of feed protein (increased levels of GOT and GPT and decreased urea and uric acid levels) for broilers in whom food soy oil cake was used alone or it was partially substituted with sunflower oil cake (7%) and fishmeal (2%) compared with those lots where only Sunflower Oil cake (7% and 12%) has been introduced.

In essence, investigated sanguine biochemical indices (total protein, total fat, cholesterol, glucose, GOT, GPT, LDH, urea, uric acid) confer higher metabolic advantages in broilers fed only using soy oil cake or in those for which soy oil cake was replaced with sunflower oil cake and fish meal, supporting the scientific results.

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