THE EFFECT OF ENERGO – PROTEIC LEVEL AND ENERGY – AMINOACIDS RELATIONS ABOUT EVOLUTION OF BODY WEIGHT AT ARBOR ACRES HYBRID

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Abstract

The aim of this paper is to established the influence of energo-proteic level and energy-aminoacids relations about body weight evolution at Arbor Acres hybrid for advice about parameters the farmers so to realised the best performances. For growth performances set of the broilers from experiments, has been recorded the food quantities and the week average weights on base of are calculated the weight gains and feed coversion efficiency.

Key words: energo-proteic level, energy, aminoacids

INTRODUCTION

On the Romanian market in the past fifteen years, many hybrids of chicken meat such as Shaver, Arbor Acres, Cobb, Lohmann, Hybro etc competing with Romanian hybrids, in particular Robro hybrid. Nutritional and economic optimized combined feed of meat chickens given the phase of growth can be achieved only on the basis of verifiable scientific standards in the conditions of our farms and nutritional performance of software that have the genetic potential of hybrid, nutritional value of raw materials used in our country and the microclimate completed in halls growth.

This paper compared and proposed to establish the influence of protein-energy and energy-amino reports on developments in Arbor Acres hybrid body weight in order to advise farmers parameters that allow them to achieve the best performance both in appearance and biological economically.

MATERIAL AND METHODS

The biological material used in the experiments was the hybrid Arbor Acres, and the experiment was conducted at IBNA Baloteşti on 240 day-old chicks.

Were organized four experimental groups E_1 - E_4, each consisting of 60 chickens each, equal numbers of males and females. Premises growth were provided with water and nutritious and have provided microclimate factors in accordance with the guidelines for growth.

Experience in technology has been used for feeding threephases the three types of feed mixed for each lot: starter recipe in 1-21 days; grower between 22-35 days and finisher between 36-42 days (Table 1). Recipes for batch E_1 - witness had an energy content between 3100 and 3150 kcal EM/kg. and protein level of 20.5% PB in starter, 19% PB increase in grower and 17.5% PB in finishing.

Lot E_2 received recipes with energy and protein values greater than the E_1 lot - witness the 3150 kcal EM / kg. during the starter, EM 3200 kcal / kg. during growth and EM 3250 kcal / kg. during finishing, and protein levels by 21%, 19.5% and 18.2% in the three corresponding periods of growth.

Lot E_3 received prescriptions with the same energy levels but with a high protein and amino acids increased. Protein level increased to 22.1% in starter, the 20.4% growth and 18.1% respectively in finishing with about 0.5% higher than in group E_2.

Tabel 1
The experimental scheme

Group	No. of broiler	Parameters of the recipies			Objectives
		Starter 1 – 21 days	Grower 22 – 35 days	Finisher 36 – 42days	
E_1	60	3100 kcal / 13,0 Mj 20,5 % PB 1,20 % Lis. 0,53% Meth.	3150 kcal / 13,2 Mj 19,0 % PB 1,10 % Lis. 0,54 % Meth.	3100 kcal / 13,5 Mj 17,5 % PB 1,00 % Lis. 0,53 % Meth.	• Evolution of body weight • Consumption of combined fodder • Specific consumption • Energy efficiency of combined feed use to chickens
E_2	60	3150 kcal / 13,2 Mj 21,0 % PB 1,30 % Lis. 0,58% Meth.	3200 kcal / 13,4 Mj 19,5 % PB 1,20 % Lis. 0,56 % Meth.	3250 kcal / 13,6 Mj 18,2 % PB 1,10 % Lis. 0,58 % Meth.	
E_3	60	3150 kcal / 13,2 Mj 22,1 % PB 1,40 % Lis. 0,63% Meth.	3200 kcal / 13,4 Mj 20,4 % PB 1,30 % Lis. 0,58 % Meth.	3250 kcal / 13,6 Mj 18,9 % PB 1,20 % Lis. 0,62 % Meth.	
E_4	60	3100 kcal / 13,0 Mj 23,0 % PB 1,34 % Lis. 0,56% Meth.	3240 kcal / 13,6 Mj 19,99 % PB 1,14 % Lis. 0,51 % Meth.	3200 kcal / 13,5 Mj 18,5 % PB 0,94 % Lis. 0,38 % Meth.	

RESULTS AND DISCUSSION

1. Evolution of body weight of experimental chickens

Results on the average weights in weeks and lots are presented in Table 2 and Figure 1.

One day, weights of chicks were virtually equal, with an average of 35.4 g/chicken E_1 and 35.7g/chicken at E_3, Student t test, showing that there are significant differences between group E_1 - witness and experimental groups.

At 7 days (one week) are slight differences between batches, and 131.9 g/chicken E_2, 136.8 g/chicken E_3 and 133.8 g / chicken E_4 vs. 128.9 g ./chicken E_1. At 21 days chicken group E_1 - witnesses have seen an average weight of 697.6 g/chicken, those of E_2 lot of 732.2 g/chicken, the group of E_3 816.5 g./chicken, E_4 and a lot of intermediate weight, 770.9 g/chicken.

Tabel 2
Evolution of body weight

Groups	Parameters	Age (days)						
		1	7	14	21	28	35	42
E_1	$\overline{X}$	35,4	128,9	349,1	697,6	1122,8	1648,7	2104,3
	$\pm s_x$	0,47	1,71	4,77	12,77	27,97	36,36	45,47
	S	2,83	10,25	28,65	76,64	155,74	202,47	249,04
E_2	$\overline{X}$	35,7	131,9	374,9	732,2	1130,7	1662,1	2113,0
	$\pm s_x$	0,49	1,64	6,33	14,33	26,73	38,09	46,07
	S	2,93	9,83	36,91	83,06	146,40	205,14	243,78
E_3	$\overline{X}$	35,7	136,8	406,5	816,5	1260,0	1838,5	2400,8
	$\pm s_x$	0,75	3,85	10,83	18,54	31,62	32,32	46,58
	S	3,18	16,35	44,67	76,45	118,32	118,15	167,95
E_4	$\overline{X}$	35,2	133,8	387,8	770,9	1187,4	1709,6	2216
	$\pm s_x$	0,46	2,61	8,42	15,57	26,29	38,65	50,46
	S	2,73	15,65	49,74	90,78	143,97	200,82	257,29

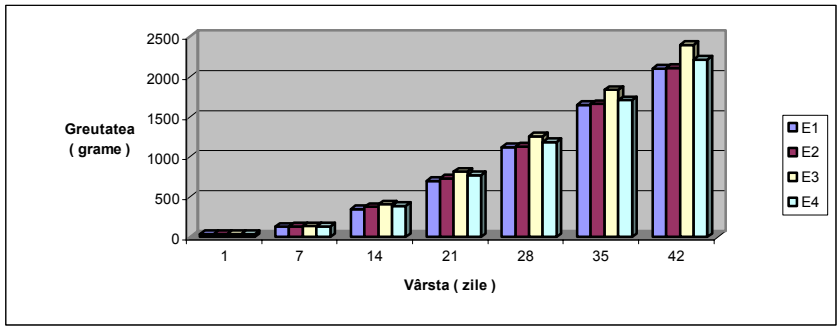

Fig. 1. Graphic representation of the evolution of body weight

At the end of the experiment, 42 days, chicks recorded average weights of 2104.3 g/chicken E_1 witness group the 2113.0g/chicken E_2 and 2400.8 g/chicken at E_3. Lot E_4 showed an intermediate weight, 2216 g/chicken. There is, throughout the experiment, that the evolution of the best record a lot at E_3 that both the energy and the protein is higher, reports that energy and energy-protein amino acids closer.

The statistical significance of differences and body weight in chickens experimentation established by Student t test are presented in Table 3. At 42 days differences between batches E_1 - E_2 witness and insensitive, but highly significant between groups E_1 and E_3. We believe that an increase in protein levels from 20.5% to 22.1% in the starter period, from 19.0% to 20.4% during the period of growth and from 17.5 to 18%, 9% Finishing with keeping a high energy level led to the achievement of significantly higher weights at Arbor Acres hybrid.

The results recorded in the lot on which the E_4 protein level increased from 23% in starter and kept at E_3 in the batch phase of growth and production shows that there is no justification for this increase in protein level, the level of limiting amino acids and lysine and methionine are level rules. Differences between batch batch E_3 and E_4 are very significant expense E_4 batch, respective the average weights of 2400.8 g/chicken consignment only E_3 and 2216.0 g/chicken group E_4.

Tabel 3
The significance of differences in body weights of experimental chicks, determined by Student t test

Group	Body weight at age:				Test *t* Student At 42 days old
	1 day	21 days	35days	42 days	
E_1 (20,5%PB/19,0 %/17,5%)	35,4 ± 0,47	697,6 ± 12,77	1648,7 ± 36,36	2104,3 ± 45,47	NS FS S FS S FS
E_2 (21,0%PB/19,5 %/18,2%)	35,7 ± 0,49	732,2 ± 14,33	1662,1 ± 38,09	2113,0 ± 46,07	
E_3 (22,1%PB/20,4 %/18,9%)	35,7 ± 0,75	816,5 ± 18,54	1838,5 ± 32,32	2400,8 ± 46,58	
E_4 (23%PB/19,99 %/18,50%)	35,2 ± 0,46	770,9 ± 15,57	1709,6 ± 38,65	2216,0 ± 50,46	

Note: *NS = unsignificant S = significant FS = very significant*

2. The combined feed consumption

The combined feed to correlate with the level of energy and protein, the biggest being the E_3 group, and 172.32 g/chicken/day in the last experimental week (Table 4).

Throughout the experimental period chicks lot E_1 had a consumption of 3636.8 g/chicken, resulting in an average over the entire experimental period of 86.6 g/chicken E_1 lot of 3503.15g/chicken batch E_2 and an average of 83.4g/chicken, and at E_3 a lot of consumer 4162.58 g/ chicken with an average of 99g/chicken/day.

E_4 has a lot average consumption of 3898.04 g/chicken and the period with an average over the entire experimental period of 92.8 g/chicken/day.

Tabel 4
The combined feed consumption of chicks experimental batches

Group	Consumption	Age (weeks)					
		1	2	3	4	5	6
E_1	g/ chicks/day	16,82	50,85	**78,36**	102,73	129,31	**141,47**
	g/ chicks/week	117,74	355,95	548,52	719,11	905,17	990,29
	g/ chiks/cumulat	117,74	473,69	1022,21	1741,32	2646,49	3636,78
E_2	g/ chicks/day	16,68	48,59	**76,26**	92,92	126,34	**139,66**
	g/ chicks/week	116,76	340,13	533,82	650,44	884,38	977,62
	g/ chiks/cumulat	116,76	456,89	990,71	1641,15	2525,53	3503,15
E_3	g/ chicks/day	17,47	62,51	**91,79**	97,57	153,02	**172,32**
	g/ chicks/week	122,33	437,58	642,52	682,99	1071,1	1206,28
	g/ chiks/cumulat	122,33	559,91	1202,43	1885,42	2956,60	4162,58
E_4	g/ chicks/day	16,11	49,50	**73,96**	97,12	123,21	**139,82**
	g/ chicks/week	112,77	346,50	517,72	679,84	962,47	1078,74
	g/ chiks/cumulat	112,77	459,27	976,99	1656,83	2619,30	3898,04

The degree of recovery of food consumption is given for specific increases in weight. In Table 5, show the specific combination of feed made from the four experimental groups.

Tabel 5
The specific combination of chicken feed from experimental groups (kg / kg growth)

Group	Specific combination on:	Age (weeks)					
		1	2	3	4	5	6
E_1	Week	1,26	1,62	1,57	1,69	1,72	2,17
	Cumulative	1,26	1,51	1,54	1,60	1,64	***1,76***
E_2	Week	1,21	1,40	1,49	1,63	1,66	2,17
	Cumulative	1,21	1,35	1,42	1,50	1,55	***1,69***
E_3	Week	1,21	1,62	1,56	1,54	1,82	2,14
	Cumulative	1,21	1,51	1,54	1,54	1,64	***1,76***
E_4	Week	1,14	1,36	1,35	1,63	1,84	2,13
	Cumulative	1,14	1,30	1,33	1,44	1,56	***1,78***

Cumulative consumption of feed per kg combined gain has been very close, respective 1.76 kg.nc/kg. growth in batches E_1 and E_3 of 1.69 kg.n.c./kg. gain at E_3 and 1.78 kg.n.c./kg. gain in group E_4. Energy efficiency combined to feed the chickens for meat hybrid Arbor Acres is presented in Table 6. Data are presented on the weeks and cumulative in each batch.

Tabel 6
Energy efficiency combined feed by chicken meat Arbor Acres

Group	Consumption kcal EM / g gain	Age (weeks)					
		1	2	3	4	5	6
E_1	Week	3,90	5,01	4,88	5,33	5,42	6,96
	Cumulative	3,90	4,68	4,78	4,99	5,13	***5,53***
E_2	Week	3,82	4,41	4,71	5,22	5,33	7,05
	Cumulative	3,82	4,24	4,48	4,75	4,94	***5,40***
E_3	Week	3,81	5,11	4,93	4,92	5,92	6,86
	Cumulative	3,81	4,76	4,85	4,88	5,21	***5,61***
E_4	Week	3,55	4,23	4,19	5,29	5,97	6,81
	Cumulative	3,55	4,12	4,16	4,57	5,00	***5,42***

CONCLUSIONS

- Levels of energy, protein and amino-acids listed above have allowed the achievement

of weight upper lot by E_3 respectively 816.5g/chicken at 21 days compared to 697.6g/chicken E_1 witness group. At age of 35 days to register the same batch weights of 1838.5g/chicken versus 1648.7g/chicken E_1 witness group. At the end of the experiment, 42 days, the same batch made an average weight of 2400.8g/chicken versus 2104.3 g/chicken E_1 lot - witness. This favorable development recorded batch of E_3, is due to the high energy level, especially with the correlation of protein and amino-acid limited, lysine, methionine + cystine.

- Cumulative combined fodder consumption per kg. gain has been very close, 1.76 kg

respectively combined feed per kg. gain in batches E_1 and E_3 and 1.69 kilograms combined feed per kg. gain in group E_2 and 1.78 kilograms combined feed per kg. gain in batch E_4. Insensitive remark, however, consumption is less specific on E_4 group by the age of five weeks, the lot on which the protein starter is highest, 23% PB.

- Under the aspect of energy efficiency food that highlight the lowest specific

consumption we recorded offspring batch E_2 using EM 5.4 kcal/g. gain, close to the E_1 and E_3 batches using 5.53 and 5.61 kcal/g. gain.

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