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THE EFFECT OF CELLULOSIC CATEGORIES FROM COMBINED FORAGES WITH BARLEY ON BROILER CHICKENS

EFECTUL CATEGORIILOR CELULOZICE DIN FURAJELE COMBINATE CU ORZ LA PUII DE CARNE

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In this experiment we have studied the effect of cellulosic categories (NDF, ADF and ADL) from combined forages with barley on nutritive and bioproductive indices at broiler chickens. The experiment was carried out on six weeks on 90 broiler chickens divided in three experimental groups: CL, EG1 and EG2. At experimental group EG1 was incorporated barley in proportion of 20% in the structure of combined forage, at EG2 was incorporated 40% barley and at control group was not incorporated barley. At the age of 3 and 6 weeks were determined the nutritive and bioproductive indices. The highest forage consumption is registered at EG1 at which in the structure of combined forages was incorporated 20% barley and was greater with 12.24% comparative with control group. The incorporation of barley in the combined forages in proportion of 20 and 40% has no significant influence on body weight of broiler chickens from experimental groups. The rising of NDF, ADF and ADL content after the incorporation of barley in the structure of combined forages in proportion of 20 and 40% determined a rising of specific consumption with 5.74% at EG1 and 8.62% at EG2.

Keywords: cellulosic categories, barley, broiler chickens

Introduction

In most European countries barley is an important feedstuff for poultry, and its use could increase with changes in economic circumstances. Compared with wheat, barley contains more fiber and less energy (Jeroch, 1995). The nutritive value and suitability of this grain as a feedstuff for broiler chickens are more or less affected by varying concentrations in NDF, ADF and ADL.

Materials and Methods

The experiment was carried out from eclosion to 42 days on 90 broiler chickens divided in three experimental groups: CG, EG1 and EG2. The hybrid used was Ross 308. The chickens from experimental groups were fed in the first period of growth from eclosion to 3 weeks with combined forage who assured 3130-3204 kcal ME and 22.78-22.2% CP. In the second period of growth from 3 to 6 weeks the combined forage assured 3156-3244 kcal ME and 20.04-20.33% CP (NRC 1994).

The forage content of NDF, ADF and ADL were established by tabular values (Englyst H., 1989) and chemical determinations.

The experimental scheme is presented in table 1.

Table 1

The experimental scheme

	CG	EG1	EG2
Period 0-3 weeks			
	Combined forage 0-3 weeks	Combined forage 0-3 weeks + 20% barley	Combined forage 0-3 weeks + 40% barley
ME (kcal/kg forage)	3204	3197	3130
CP (%)	22.91	22.91	22.78
Period 3-6 weeks			
	Combined forage 3-6 weeks	Combined forage 3-6 weeks + 20% barley	Combined forage 3-6 weeks + 40% barley
ME (kcal/kg forage)	3244	3218	3156
CP (%)	20.16	20.04	20.33

Results and Discussions

On tabular data basis and on chemical determinations we established the combined forage content in NDF, ADF and ADL, values presented in table 2.

From table 2 data it can be seen that the greatest rising of NDF content (with 2.93% in the first growth period and with 2.96% in the second growth period) was registered at the experimental group at which was incorporated 40% barley in the structure of combined forages. Regarding the ADF content, the greatest rising was also registered at experimental group at which was incorporated 40% barley in the structure of combined forages with 1.1% in the first growth period and with 1.15% in the second growth period. The ADL content register a rising with 0.41% at the experimental group with 40% barley in the structure of combined forages.

Table 2

The content of combined forages in cellulosic categories

Period	Specification	NDF* (%)	Percentage points	ADF** (%)	Percentage points	ADL*** (%)	Percentage points
Period 0-3 weeks	Combined forage 0-3 weeks	9.9	-	4.76	-	0.92	-
	Combined forage 0-3 weeks + 20% barley	11.35	1.45	5.32	0.56	1.12	0.2
	Combined forage 0-3 weeks + 40% barley	12.83	2.93	5.86	1.1	1.33	0.41
Period 3-6 weeks	Combined forage 3-6 weeks	10.07	-	4.62	-	0.96	-
	Combined forage 3-6 weeks + 20% barley	11.52	1.45	5.18	0.56	1.16	0.2
	Combined forage 3-6 weeks + 40% barley	13.03	2.96	5.77	1.15	1.37	0.41

* Neutral detergent fiber
** Acid detergent fiber
*** Acid detergent lignin

In order to establish feed consumption of chickens in the experimental groups, we weighed the feed quantities allocated to each experimental group and those remained when the chickens reached the age of 3 and 6 weeks. We calculated the feed consumption on period per chicken and the medium daily consumption for each period. The data obtained are presented in Table 3.

Table 3

Feed consumption of broiler chickens from experimental groups

Specification	CG	EG1	EG2
Period 0-3 weeks			
Consumption on period/chicken (kg)	1.11	0.89	0.98
Daily medium consumption/period/chicken (g)	53.18	42.70	46.73
Percentage differences (%)	100	80.18	88.28
Period 3-6 weeks			
Consumption on period/chicken (kg)	2.8	3.51	3.33
Daily medium consumption/period/chicken (g)	133.76	167.18	158.98
Percentage differences (%)	100	125.35	118.92
Period 0-6 weeks			
Consumption on period/chicken (kg)	3.92	4.4	4.32
Daily medium consumption/period/chicken (g)	93.47	104.94	102.86
Percentage differences (%)	100	112.24	110.2

From table data it can be seen that on entire growth period the smallest forage consumption is registered at CG at which was not incorporated barley in the

combined forage structure. The highest forage consumption was registered at EG1 at which in the structure of combined forage was incorporated 20% barley and was with 4.94% greater comparative with control group.

In order to establish the evolution of body weight we weighed the chickens at one day, at 3 weeks and at 6 weeks of age. The obtained results are presented in Table 4. From table data it can be seen that at 42 days of age the highest body weight was registered at EG1 and was with 5.64% greater than CG. This difference is statistical insignificant. The experimental groups EG2 registered a greater body weight than CG with 1.09%, difference that is statistical insignificant. Therefore it can be said that the incorporation barley in the structure of combined forages has no significant influence on body weight.

Table 4

The evolution of body weight at chickens from experimental groups

Specification	CG	EG1	EG2
n	30	30	30
Weight at eclosion (g)	39±0.38	39±0.34	39±0.35
n	28	29	27
Weight at 3 weeks (g)	866.3±18.5	657.5±22.1	656.3±16.9
Percentage values	**100**	**75.89**	**75.75**
CV (%)	9.03	13.43	10.32
Statistical differences		***	***
n	16	16	16
Weight at 6 weeks (g)	2292.3±89.6	2421.8±80.2	2317.4±66.8
Percentage values	**100**	**105.64**	**101.09**
CV (%)	14.63	12.82	11.16
Statistical differences		**NS**	**NS**

NS – $p > 0.05$; * $p - < 0.05$;** $p < 0.01$;*** $p < 0.001$

Corroborating the consumption data with body weight we obtained the specific consumption. The evolution of specific consumption is presented in the table 5. On the entire growth period the smallest specific consumption was registered at CG (1.74kg). The others experimental groups register a higher specific consumption, with 5.74% at EG1 at which was incorporated 20% barley and with 8.62% at EG2 at which was incorporated 40% barley.

Therefore it can be said that the rising of NDF, ADF and ADL content determines a rising of specific consumption at broiler chickens.

Table 5

The evolution of specific consumption at chickens from experimental groups

Specification	CG	EG1	EG2
Period 0-3 weeks			
Consumption on period / chicken	1.11	0.89	0.98
Gain / period / chicken (g)	827.38	618.5	617.25
Specific consumption (kg feed / kg gain)	1.35	1.45	1.59
Percentage differences	100	107.4	117.7
Period 3-6 weeks			
Consumption on period / chicken	2.8	3.51	3.33
Gain / period / chicken (g)	1425.91	1764.3	1661.08
Specific consumption (kg feed / kg gain)	1.97	1.99	2.01
Percentage differences	100	101.01	102.03
Period 0-6 weeks			
Consumption on period / chicken	3.92	4.4	4.32
Gain / period / chicken (g)	2253.29	2382.8	2278.33
Specific consumption (kg feed / kg gain)	1.74	1.84	1.89
Percentage differences	100	105.74	108.62

Conclusions

- the incorporation of barley (20% and 40%) in the structure of combined forage determines the rising of NDF, ADF and ADL content,

- the rising of NDF, ADF and ADL content in the combined forage fed to broiler chickens determines the rising of forage consumption with 12.24% at EG1 which have in the structure of combined forage 20% barley and with 10.2% at EG2 which have in the structure of combined forage 40% barley,

- the body weight rises with 5.64% at EG1 at which was incorporated in the structure of combined forage 20% barley and with 1.09% at EG2 at which was incorporated in the structure of combined forage 40% barley, but the differences are statistical insignificant,

- the specific consumption rises at experimental groups who consumed forage with barley in their structure (with 5.74% at EG1 and with 8.62% at EG2),

- the incorporation of barley in the structure of combined forage determines the rising of NDF, ADF and ADL content, which leads to inferior nutritive and bioproductive indices comparative with the control group at which was not incorporated barley.

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