



CODEN [USA]: IAJPBB

ISSN: 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.3270790>

Available online at: <http://www.iajps.com>

Research Article

INFLUENCE OF CRUDE FIBER LEVEL IN THE DIET GROWTH AND DEVELOPMENT OF QUAIL

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Article Received: May 2019

Accepted: June 2019

Published: July 2019

Abstract:

Cheaper diets are one of the most important tasks in feeding the birds, but the preservation of their meat or egg qualities remains an important indicator. Therefore, we consider it expedient to study the possibility of raising young quails using cheaper components of compound feeds with preservation of productivity during feeding or laying. Studies have shown that the high content of crude fiber in the feed in the starting period (0-28 days) does not adversely affect the increase in body weight relative to the quail growth schedule for 28 days, which is 110gr. The live weight of the birds in the control group at the end of the experimental period 0-28 days was 141.3 g, which is higher than in the first one by 6.76 g (or 4.79%), in the second one it was 11.38 g (or by 8.06%), in the third one by 13.1 g (or 9.27%) and in the fourth by 18.2 g (or 12.89%), with the following levels of crude fiber in the compound feed: 5, 0%, 6.4%, 8.5%, 11.0% and 14.2%, respectively.

Keywords: *feed, raw fiber, Japanese quail, increase in live weight, physiological experience.*

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Please cite this article in press Alexander Ratoshny et al., **Influence Of Crude Fiber Level In The Diet Growth And Development Of Quail.**, Indo Am. J. P. Sci, 2019; 06(07).

INTRODUCTION:

Quailing has several advantages in comparison with other types of poultry - high growth rate, dietary value of eggs and meat, egg production occurs at five to six weeks of age, which accelerates the cost recovery [6, 7].

The main share of the cost is for feed. Therefore, one of the ways to increase economic efficiency is the use of cheaper protein feeds - sunflower cake, malt sprouts. However, these feeds are characterized by a high level of fiber and low energy value [2, 4, 8].

Our searches in the literature on the establishment of standards for the level of crude fiber in the diets of young quails have shown that such studies have not been conducted. Therefore, we set a goal to study the effect of different levels of crude fiber on the

productivity and physiological state of young quails of the Japanese breed.

To achieve this goal it was necessary to solve the following tasks: to study the growth rates and feed costs; determine the digestibility of feed.

MATERIAL AND METHODS:

The experiment took place in the vivarium of Premix LLC (Timashevsk) in June-July 2017. According to generally accepted methods, the dynamics of body weight, bird safety, digestibility of feed and economic efficiency were determined. To obtain data on the growth dynamics, the birds were weighed weekly (during landing, on the 7th, 14th, 21st and 28th days).

5 groups of 360 animals each were formed. The scheme of experience is presented in table 1.

Table 1: Scheme of scientific and business experience 0-28 days

Group	Number of heads	The level of crude fiber in the diet, %
Control	360	5,0
1st experienced	360	6,4
2nd experienced	360	8,5
3rd experienced	360	11,0
4th experienced	360	14,2

During this period, the bird of all experimental groups received feed with the same content of crude protein, crude fat, amino acids, mineral substances, but with different content of crude fiber: control - 5.0%, 1st - 6.4%, 2nd - 8.5%, 3rd - 11.0% and 4th -

14.2% and, as a consequence, a lower content of exchangeable energy. The chemical composition of the feed was determined in the testing laboratory of Premix LLC in the city of Timashevsk and is given in Table 2.

Table 2: The chemical composition of compound feed START (0-28 days)

Indicator	Group				
	Control	1st experienced	2nd experienced	3rd experienced	4th experienced
Crude protein, %	27,0	27,0	27,1	27,2	27,05
Crude fat, %	5,44	5,40	5,49	5,46	5,47
Crude fiber, %	5,0	6,4	8,5	11,0	14,2
Exchange energy, MJ / kg	12,3	12,1	11,8	11,6	11,1
Potassium, g / kg	7,24	7,32	7,35	7,36	7,29
Sodium, g / kg	1,59	1,50	1,49	1,51	1,53
Magnesium, g / kg	1,39	1,45	1,41	1,46	1,38
Calcium, g / kg	11,1	11,0	11,4	11,7	11,5
Phosphorus, g / kg	8,0	8,3	8,4	8,2	8,4
Chlorine, g / kg	1,05	1,09	1,02	1,10	1,07
Sulfur, g / kg	2,52	2,45	2,43	2,44	2,51
Lysine, g / kg	17,5	17,9	17,6	17,5	17,7

Methionine, g / kg	7,8	8,2	8,4	7,8	8,1
Methionine + cystine, g / kg	9,5	9,4	9,7	9,5	9,2
Threonine, g / kg	10,1	10,8	10,8	10,1	11,0

RESULTS AND DISCUSSION:

The main indicators for growing, affecting the economic indicators and characterizing the growth and development of poultry are its live weight, average daily gains and feed costs per 1 kg gain in live weight, calculated on the basis of data on average daily feed consumption and growth rate of young birds [1, 9].

Indicators of live weight, gains, consumption and feed costs of Japanese breed quail for a period of 0-28 days in diets with different levels of crude fiber are shown in Table 3.

It is interesting to note that up to 14 days quail grew almost the same, even for 21 days in the 2nd experimental group their live weight differed from the control group by only 0.9 g and only in the period of 21-28 days the negative effect was most pronounced fiber growth with a significant difference.

This means that the insufficient in terms of energy concentration, the quality of the feed was compensated for by its substantial consumption.

Table 3: Indicators of body weight, gains, consumption and cost of feed in quail 0-28 days on rations with different content of crude fiber

Indicator	Group				
	Control	1st experienced	2nd experienced	3rd experienced	4th experienced
Average live weight of 1 head, g:					
When setting (0 days)	8,30±0,71	8,35±0,12	8,25±0,15	8,27±0,04	8,26±0,13
7 day	34,46±0,8	36,59±1,1	35,93±0,9	32,69±0,9	31,0±1,8
14 days	68,0±1,8	71,53±1,4	66,57±1,5	68,89±2,1	59,11±1,6
21 days	109,4±6,9	106,0±1,5	108,5±2,5	102,7±3,7	94,67±1,5
28 days	141,3±11,8	134,5±2,4	129,9±4,9	128,2±4,5	123,1±4,9
The absolute increase in live weight of 1 head, g	133,00	126,19	121,67	119,86	114,84
Average daily gain in live weight 0-28 days, g	4,75±0,42	4,51±0,09	4,34±0,18	4,28±0,03	4,10±0,18
% Control	100	94,5	91,4	90,1	86,9
The cost of feed per 1 kg increase in live weight	3,52±0,32	4,93±0,14	5,29±0,22	5,83±0,03	6,40±0,46
% Control	100	140,0	150,3	165,6	181,8
Safety, %	95,85±4,2	98,4±1,6	99,20±0,8	95,0±5,0	95,8±4,2
Feed consumption per 1 head per day, g	16,33±0,3	22,12±0,6	22,79±0,2	25,5±0,3	25,95±1,0
% Control	100	135,5	139,6	156,2	158,9
The cost of 1 kg of feed, rub.	25,41	24,40	22,56	19,20	17,61
The cost of feed per 1 kg increase in live weight, rub.	89,4	120,3	117,3	111,9	112,7

The average daily gains on average for 28 days in the experimental groups were lower by 5.1-13.7%, while the difference between the control and 1st

experimental groups was not significant ($P > 0.05$), relative to 2-4 groups - reliable with $P < 0.05$. At the beginning of the experiment in all groups, the

average live weight of the bird was almost the same and ranged from 8.25 to 8.35 g. The live weight of the bird in the control group at the end of the experimental period 0-28 days was 141.3 g, which is higher than in the first experienced at 6.76 g (or 4.79%), in the second experienced at 11.38 g (or 8.06%), in the third experienced at 13.1g (or 9.27%) and in the fourth by 18.2 g (or by 12.89%), with the following levels of crude fiber in the compound feed: 5.0%, 6.4%, 8.5%, 11.0% and 14.2%, respectively. The cost of feed per 1 kg increase in live weight was as follows: control - 3.52 kg, 1st group - 4.93 kg (140%), 2nd group - 5.29 kg (150.3%), 3rd group - 5.83 kg (165.6) and the 4th group - 6.40 kg (181.3%).

Upon reaching the 21-day quail, a physiological (exchange) experiment was carried out, which lasted 4 days, in order to study the digestibility of the mixed feed nutrients, by taking into account the feed eaten and the litter selected during this period from each group [3, 5]. On the basis of the obtained data, the nutrient digestibility coefficients of the complete feed were calculated, presented in Table 4.

With an increase in the level of crude fiber in the compound feed, the digestibility of dry matter, nitrogen deposition, and the digestibility of calcium and phosphorus decreased.

Table 4: Nutrient digestibility ratios of feed aged 21-24 days,%

Indicators	Group				
	Control	1st experienced	2nd experienced	3rd experienced	4th experienced
Dry matter	66,36	62,45	60,59	60,08	61,84
Nitrogen deposition,% of consumption	66,58	69,48	61,87	64,37	59,61
Raw fat	90,08	89,79	92,88	89,89	90,96
Crude Fiber	36,03	35,8	37,8	35,5	36,6
Calcium	34,37	32,33	34,02	32,05	31,31
Phosphorus	39,72	48,61	37,44	33,12	31,14

To assess the biochemical parameters of blood in quails of Japanese breed at the age of 26 days after 6 hours of fasting exposure, blood was taken for

analysis in the testing laboratory of Premix LLC. The results of biochemical studies of blood serum are presented in the table (put down the serial number).

Table 5: Biochemical parameters of blood serum (n = 3)

Indicator	Group				
	Control	1st experienced	2nd experienced	3rd experienced	4th experienced
Glucose, mol / l	21,5±1,4	20,9±0,8	21,04±1,4	18,6±0,41	23,36±0,22
Total protein, g / l	29,8±3,8	30,0±0,6	22,1±0,3	30,15±3,4	27,96±2,7
Albumins g / l	9,5±2,0	8,4±0,8	11,05±0,45	12,4±0,6	11,8±0,9
Globulins, g \ l	21,3±4,7	21,65±0,15	11,05±0,75	17,9±2,9	16,2±1,9
ALT, e / l	25,3±0,6	21,6±0,8	20,45±0,35	19,2±0,9	20,8±1,2
AST, e / l	284,4±0,3	266,9±1,6	259,3±2,6	284,4±5,9	288,5±8,2
Mmol / l cholesterol	4,82±0,08	4,7±0,74	4,83±0,3	3,77±0,32	3,9±0,3
Urea, mmol / l	0,35±0,15	0,45±0,15	0,7±0,1	0,55±0,05	0,45±0,05
Calcium, mmol / l	2,5±0,1	2,25±0,15	3,3±0,2	3,3±0,1	2,25±0,15

Phosphorus, mmol / l	2,52±0,47	2,39±0,25	2,24±0,05	2,29±0,11	2,14±0,14
Magnesium, mmol / l	0,79±0,09	0,73±0,03	0,63±0,02	0,71±0,13	0,77±0,03
Iron, mmol / l	29,3±7,2	28,6±0,7	25,0±0,1	21,0±0,4	26,9±0,6
Copper μmol / l	3,55±0,26	3,95±0,08	4,17±0,09	4,96±0,7	4,7±0,16
Zinc, mol / l	45,25±2,5	40,5±0,7	48,85±0,65	53,6±0,7	39,4±0,8
Potassium, mmol / l	4,95±0,45	4,9±0,3	4,3±0,3	5,15±0,05	4,85±0,15
Sodium, mmol / l	156,0±0,7	158,2±2,75	150,9±2,4	159,6±0,2	153,9±15,2
Chlorides, mmol / l	87,55±0,25	85,6±3,2	84,1±1,5	83,5±0,5	81,7±0,7

In general, the analysis of the results showed that the biochemical parameters of the blood of quails of the control and experimental groups were within the physiological norm.

CONCLUSION:

Despite the fact that the highest cost of feed was in the control group, and the lowest in the experimental groups with sunflower meal and malt sprouts, the lowest cash costs per kg of body weight gain were in the control group and amounted to 101.8 rubles, while in experienced groups from 104 to 110 rubles for the whole experience.

The possibility of using cheap feeds (sunflower oil cake, malt sprouts) is possible while ensuring a normalized level of exchange energy.

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