

THE IMPORTANCE OF PROTEIN QUANTITY AND QUALITY FOR DIFFERENT PHEASANT CATEGORIES IN AVIARIES AND NATURE

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Summary: This paper presents a review of pheasants needs in protein, depending on the life conditions (pans, hunting ground) and age category (in aviaries: a parent flock, pheasant chickens; at the hunting ground: adult pheasant, pheasant chickens settled in the hunting ground). The level of protein in the parent flock meal is important for the hatching eggs, weight and fertility, and for the pheasant chickens is important for the optimum weight achieving and development during the settlement of the hunting ground. Summer feeding of the pheasant chickens in the hunting ground allows further development and the body reserves formation for the winter period, so you should use the appropriate protein concentrates. Winter-feeding is especially important for providing increased energy needs and can be done with wheat grains.

Keywords: pheasant, proteins, food, aviaries, hunting ground.

Introduction

Proteins are specific building substance and in the mono-gastric animals it , cannot be replaced with other chemical substances. Therefore, it is extremely important that pheasants grown in aviaries (breeding flocks and offspring) are fed with mixture, made of adequate quantity and quality of protein, in the presence of some other essential nutrients (energy, minerals and vitamins). The corresponding protein levels, and overall chemical composition of the meal for the parent flock of pheasant, are important for the laying eggs, conception and eggs incubation, as well as the growth of pheasant chickens. [29, 31]. In addition, body mass of pheasant chickens, grown under controlled conditions, is of great importance in their settling into the hunting grounds. Body reserves, obtained in the early period of growing, are important for the survival of the pheasants in the wild, as in the first period the peasants compensate the deficit in food [2]. Therefore, the pheasant chickens mortality is reduced and increased the number of these feathery wild birds in the hunting grounds [30], although it has been experimentally demonstrated the possibility of compensatory growth. Higher levels of protein than required in feed for the pheasant is more expensive and may increase the mortality of pheasant chickens due to pathological changes in liver and kidneys [25]. For this reason, care should be taken on the optimal balance of concentrate mixtures [5, 14].

The importance of protein for production parameters of different pheasant categories in aviaries

Feeding of the parent flock has a significant impact on number of eggs [4], their mass [36] and fertility [21]. Ipek and Dikmen found that greater mass of eggs hatches greater mass of pheasant chickens but there is no significant effect of egg mass to mortality of pheasant chickens. This authors have classified the eggs by weight into three groups (27,8-29,7; 29,8-31,7 and 31,8-33,7g) and thereby determine the mass of pheasant chickens in the same order of 19,5; 21,8 and 22,6g (P<0,01). In the pheasant chickens feeding, Beuković used three concentrate mixtures with 22%, 19% and 16% of crude protein, while the energy level was the same in all mixtures (11,71 MJ). Pheasant chicken mass at hatching amounted to 21,87g, 21,59g and 21,09g, respectively the greatest mass had the chickens from hens fed with the mixture with the highest protein level. Meal nutrients such as protein and energy sources have a much greater effect on the formation of eggs than on hen's fertility, where the dominant role has vitamins and minerals. [7]. In addition to the nutritional, on the success of incubation affects a large number of other factors, such as involvement of people, the regime of incubators, climatic and other factors [28].

Restraint needs of pheasant parent flock in aviaries can be satisfied with grains food or some simpler mixture (40-55 g/day/individual). However, the needs of pheasants hens are much higher because their capacity for 90 days is 41-45 eggs [35], while the laying eggs in nature is 12-18 eggs [29]. Parent flock should be fed with concentrate mixture for laying eggs since January. In the period of laying eggs, daily amount of pelleted concentrate is 80g, respectively, for entire period of laying eggs is about 7,2kg.

AEC [1] and INRA [19] recommendations cite the required level of protein for pheasants laying hens of 15%. In contrast, Hanus and Fiser[15] cite a much greater needs, that are minimum 18 % of crude protein in pre-laying egg period, and during the laying eggs period about 20-25%. Djordjević et al. [7] points out that the needs of different types of mono-gastric animals can be satisfied with lower protein level, if the necessary level of limiting amino acid is provided, particularly methionine and lysine [17]. One of the problems in industrial production of animal feed in

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Serbia is the lack of precise data on chemical composition of nutrients, especially amino acid content, that result with bad production. [9]

There are numbers of recommendations for chemical composition of concentrate mixture for pheasant chickens, which is significantly different in the quantity of certain nutrients. According to the AEC [1] and IRA [19] recommendations, the needs in protein for the first phase of breeding (0-4 weeks) are 24% (AEC) respectively 23,1-28,7% (INRA), while for the second phase of breeding 20%(AEC) respectively 14,8-17,2%(INRA). Woodard et al. [37] recommended amount of 18% in battery mode breeding of pheasant and 16% for the fertile system. However, in recent years, these recommendations are even higher and move in the protein range of 20 to 40% [34]. According to the NRP [22] protein level in mixture for the first phase of pheasant breeding is 28% and for the second is 24%.

Domestic research [10, 25, 26, 27] indicate that high levels of protein in meals (30%) for pheasant chickens aged 28 days allow the greatest gains compared to the protein level of 28 and 26% (Table 1). Rizvanov et al. [32] used the concentrate mixture with 25, 28, 30 and 38% of crude protein for pheasant chickens breeding. In addition, pheasant mass after the 50th days of life amounted 401,3; 434,3; 452,3 and 451,2 g. That means that there is a physiological limit for the protein level in meal, after which animals do not react with further increased growth. Excess of protein in such cases, after deamination, can be used as an energy source [24], which is irrational, and can negatively affects on the pheasant chickens health [10]. Otherwise, the efficiency of using nutrient and grown intensity depends on other factors, such as sex. For example, Maletić [20] cites that the difference between sexes in pheasant chickens mass on the 60th day of life is 91,10g.

Table1. Daily weight growth and food consumption of pheasant chickens fed with different levels of protein. [25]

Phase	Density	I (30% SP)		II (28% SP)		III (26% SP)		Average	
		Growth g/day	Food consumption g/day	Growth g/day	Food consumption g/day			Growth g/day	Food consumption g/day
I (to 28 th day)	550	9,00	22,13	5,33	18,43	I (to 28 th day)	550	9,00	22,13
	450	9,99	26,89	6,08	21,66		450	9,99	26,89
	Average	9,50	24,51	5,71	20,05		Average	9,50	24,51
	Index %	166,37	122,24	100,00	100,00		Index %	166,37	122,24
II (from 28 th day)	550	9,45	22,83	5,63	19,60	II (from 28 th day)	550	9,45	22,83
	450	10,76	27,38	7,15	23,74		450	10,76	27,38
	Average	10,11	25,10	6,39	21,67		Average	10,11	25,10
	Index %	158,21	115,82	100,00	100,00		Index %	158,21	115,82
Average	550	9,23	22,48	5,48	19,01	Average	550	9,23	22,48
	450	10,38	27,13	6,62	22,70		450	10,38	27,13
	Average	9,81	24,81	6,05	20,86		Average	9,81	24,81
	Index %	162,14	118,93	100,00	100,00		Index %	162,14	118,93

The Importance Of Protein For The Production Parameters Of Pheasants In Nature

Protein needs of pheasant in nature vary depending on age category and season. Can be evaluated based on the crop content [6]. For example, the adult peasants' part of their needs (10-30%) satisfied with consumption of insects and larvae, which contain high protein level and high content of limiting acids [29]. In addition, selective feeding of plant origin food (leaves and buds) supplies protein. During the summer, and autumn in particular, grows and eventually becomes the dominant the involvement of wild and cultivated plants seeds, which allows the increase of energy reserves and preparation for the winter.[8] Involvement of the insects in the daily meal of the pheasant chickens aged up to 10 weeks may be up to 80%. Young pheasants daily collect 500-1000 insects and 400-600 weeds seeds, while in older ones, the remains of rats and mice were found. [25] .

Attempts to increase natural production in hunting grounds with additional spring feeding did not affect on pheasants hen laying eggs. [16] In contrast, supplemental protein feeding of young pheasant, settled in the hunting ground, leads to the increscent body much more than in the case of supplemental energy feeding. [33] Sage et al.[33] examined the influence of supplemental feeding of pheasants aged 6-16 weeks, with concentrate mixture that contain 20% protein, 4% fat(oil), 4,5% cellulose and 6% ash. In contrast, control pheasants groups after the tenth

week of life received only wheat grain, containing about 10% crude protein. In addition to these meals, pheasant has unlimited accessibility of natural plant's and animal's origin food. Nevertheless, the authors found significant differences in body weight and amount of fat in 100 hunted birds (50 males and 50 females) aged 22-24 weeks (Table 2). This means that the supplementary pheasant feeding during the summer should be carried out with concentrate mixtures with higher protein levels, to ensure the further growth of young birds and minimize losses during the winter.

In winter, for pheasants' feeding should be used all energy nutrients, or wheat grains, in order to provide increased energy needs [8, 11, 12, 13].

Table 2. Body weight, muscle and fat, as well as the length of pheasant's shank [33].

Parameters	Protein meal	Male (n=50)	Female (n=50)	Differences between meals, by gender
Weight (g)	20%	1336,7±27,1	1034,8±27,1	F _{1,8} = 4,41, P < 0,1
	10%	1317,7±33,1	980,2±33,1	
Pectoral muscle mass (g)	20%	201,7±3,9	153,3±3,9	F _{1,8} = 0,25, P > 0,1
	10%	203,8±4,8	152,9±4,8	
Cloacal fat mass (g)	20%	5,58±1,63	13,09±1,63	F _{1,8} = 6,25, P < 0,05
	10%	4,53±2,00	8,58±2,00	
Shank length (mm)	20%	73,6±0,4	66,3±0,4	F _{1,8} = 0,20, P > 0,1

Conclusion

The literature review shows that different categories of pheasants in avaries (parent flock, pheasant chickens) have a high protein need, which is higher in comparison with fowl, and have similar needs as turkeys. This requires the use of high-quality balanced concrete, taking into account not only of the protein level, but also of limiting amino acids. In this respect, the most important are methionine and lysine. After settling of pheasant chickens in the hunting ground, it is recommended to continue feeding with mixture concentrate to achieve greater body mass and decreased mortality by winter. During the winter, the biggest part have an energetic concentrates.

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