

Chick Growth in Red-Legged Partridge (*Alectoris rufa*) Fed with Two Commercial Feeds

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Abstract: Growth and feed consumption during the 1st month of life of red-legged partridge (*Alectoris rufa*) chicks was compared when feeding with two different commercial starter mash containing 27.5 and 28.6% crude protein, respectively. At 30 days old, chicks weighed 180 g, grew at an average daily gain of 5.8 g day⁻¹ and consumed 20.5 g day⁻¹ starter mash with a feed conversion of 3.5 without difference between both feeds although, one of them contained more protein and fat and less fibre. This implies that similar efficiency is achieved when raising red-legged partridge chicks fed with commercial starter mash from different brands.

Key words: Red-legged partridge, *Alectoris rufa*, growth, feed conversion, feeding

INTRODUCTION

Red-legged partridge (*Alectoris rufa*) game farming has undergone a remarkable expansion in several countries during the past four decades (Gonzalez-Redondo *et al.*, 2010). It has become so important that several companies produce specific feeds for game birds. However, commercial chick-starter mash used in red-legged partridge may differ from each other because they are formulated for game birds in general such as pheasants, partridges and others and the fact that each brand uses different formulation strategies.

In partridge farming, one of the most critical phases is the raising of the chicks during the 1st week of life whose viability largely depends on adequate nutrition. To feed the red-legged partridge chicks during the 1st age, breeders choose from a wide range of starter mash from different brands. However, it has not yet been investigated whether the feeds for game birds of different brands are equally effective in terms of chick growth. Thus, this study was aimed at verifying whether the use of two different brands of chick-starter mash for game birds lead to differences in red-legged partridge chick growth during the 1st month of life.

MATERIALS AND METHODS

Red-legged partridge chicks hatched in June 2006 from eggs coming from a game farm located in the province of Cordoba (Spain) were used. The eggs were artificially incubated at the Experimental Farm of the

Table 1: Percentage composition of the feeds used in the study

Raw materials (inclusion %)	Feed A	Feed B
Toasted extracted soybean meal	56.20	55.10
Corn	30.00	16.80
Wheat	4.80	16.50
Animal fats	4.30	3.50
Barley distillers grains	-	3.50
Wheat middlings	-	6.20
Extruded full-fat soybean	-	2.70
Calcium carbonate	1.20	0.50
Sodium chloride	0.30	0.45
Monocalcium phosphate	1.90	-
Dicalcium phosphate	-	2.26
Sodium bicarbonate	0.04	-

ETSIA, University of Seville (Spain) according to the recommendations for handling red-legged partridge eggs (Gonzalez-Redondo, 2006; Gonzalez-Redondo, 2010). The chicks were raised from hatch to one month of age in a heated room (27±0.5°C). Each batch of chicks had an infrared lamp heater (250 W) that provided 45°C under the lamp during the 1st week and 40°C during the 2nd week. From the beginning of the 3rd week to the end of the trial the heater lamps remained off. The photoperiod was 15 h light and 9 h dark.

The chicks were divided into 2 groups of 18 chicks each housed in separated boxes, measuring 125×50 cm with bedding of pine shavings. Each experimental group was fed *ad libitum* with a different commercial chick-starter mash for game birds (brands A and B) whose percentage composition of raw materials and chemical composition analysis are shown in Table 1 and 2, respectively. The feeds were administered in chick feeder trays during the 1st week and in little hoppers thereafter. The individual weight of the chicks at 2, 9, 16, 23 and 30

Table 2: Chemical composition of the feeds used in the study

Constituent	Feed A	Feed B
Crude protein (%)	28.6	27.5
Ether extract (%)	6.7	5.7
Crude fibre (%)	3.5	5.10
Crude ash (%)	7.8	6.7
Methionine (%)	0.51	0.7
Added vitamins		
Vitamin A (IU kg ⁻¹)	13,000	12,000
Vitamin D3 (IU kg ⁻¹)	1,500	2,500
Vitamin E (mg kg ⁻¹)	100	80

days of age and overall feed consumption for each group during each weekly interval between these ages were registered. For these periods, feed consumption, feed conversion (overall for each experimental group) and average daily gain (for each chick individually) were calculated. The differences in weight between the chicks of each group were analysed by Student's t test using SPSS 15.0 software.

RESULTS AND DISCUSSION

Chick growth was optimal (Table 3), the chicks reaching in successive controls, higher weight than that described for this species by Perez and Perez up to an age of 20 days (77-80 g) by Perez up to 28 days (135 g) and by Rosell and Caballero up to 30 days (135 and 152 g, respectively). This higher growth may be due in part to improved farming techniques and feed formulation occurred in the time between these studies and the present research as well as the use of feeds with different nutritional values not indicated in any of these researches.

Feed consumption and feed conversion (Table 4) during the 1st week were high in part because it could have been produced some waste because the feed was supplied in chick feeder trays.

Both parameters showed a reduction in the period between 10 and 16 days partly as a result of the replacement of the chick feeder trays by hoppers, this scaring the chicks in the first day after the replacement.

This agrees in part with the lower weight gain observed by Caballero during the 1st week of chicks' life, explained by the fact they have to learn to move around the lodgement and become familiar with the drinkers and feeders.

The cumulative feed consumption during the whole period was similar for both feeds (583 g feed A and 566 g feed B). The feed conversion was similar for both feeds but higher than described in partridges (2-2.0) by Laffolay. The average daily gain, slightly exceeded the value

Table 3: Red-legged partridge chicks growth during the 1st month of life

Age (days)	Feed A (n = 18)	Feed B (n = 18)	p value
2	17.52±0.62	16.44±0.55	0.201
9	42.50±1.38	44.11±1.48	0.429
16	80.17±2.31	83.74±3.03	0.355
23	129.85±3.41	137.73±4.44	0.169
30	178.54±4.48	181.37±5.99	0.708

SEM: Standard Error of Mean; Mean±SEM (g)

Table 4: Average feed consumption, average daily gain and feed conversion

Period (days)	Feed consumption (g/chick and day)		Average daily gain (g day ⁻¹)		Feed conversion	
	Feed A	Feed B	Feed A	Feed B	Feed A	Feed B
2-9	20.6	22.9	3.57	3.95	5.76	5.79
10-16	10.3	8.3	5.38	5.66	1.92	1.46
17-23	22.5	24.2	7.10	7.71	3.16	3.14
24-30	29.9	25.4	6.96	6.23	4.30	4.07
Overall 2-30	20.8	20.2	5.75	5.89	3.62	3.43

(5.08 g day⁻¹) described by Caballero. Although, feed A was slightly more proteic, fatty and rich in minerals that B which was more fibrous and rich in methionine (Table 2) no differences were found in chick growth (Table 3 and 4) feed consumption and feed conversion (Table 4) regarding the brand of feed.

Thus both commercial feeds may be considered equally effective in achieving adequate red-legged partridge chick growth. These are feeds with very high protein concentration as recommended for the first age in wild birds.

Indeed, the diet of red-legged partridge chicks during the first 3 weeks of life includes in the wild, higher proportion of animal matter than vegetal matter, implying high protein requirements and of protein of high biological value.

For this reason, recent recommendations for starter feeds set the minimum crude protein content by 28% which satisfied the feeds of this experience. The protein level is much higher than commonly used in feeds for broilers (Azarnik *et al.*, 2010).

CONCLUSION

In the study, no differences in growth were found when feeding the red-legged partridge chicks during the 1st age with two different commercial starter mashes. However, the fact that the chicks grew similarly with both feeds, maintaining consumption parameters and feed efficiency also similar despite the differences in the composition of feeds suggests the interest to investigate more precisely about the specific nutritional recommendations for red-legged partridge chicks.

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