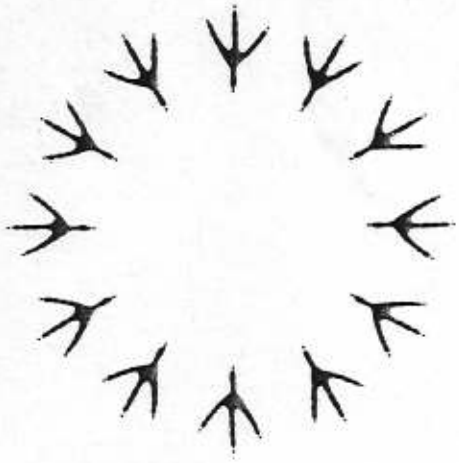

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Barcelona 25 a 28 de Junio de 1990 / *25 June to 28 June 1990*

Memoria
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Alimentación
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PROTEIN REQUIREMENT OF GROWING RED-PARTRIDGES

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INTRODUCTION

The naturalists demonstrated that the different species of partridges are characterized by differentiated *pabula*. Their observations are confirmed by the results of some researches carried out on different intensively-bred partridge-species. The nutrient requirement tabulated for generic partridges in fact differs from the nutrient requirement of the grey partridges (*Perdix perdix* L.). During laying period (9,10) and especially during the 1st weeks of age (2,3), grey partridges need feeding with higher protein content than the tabulated values for chukar partridges (*Alectoris chukar* G.) (8) or for generic partridges (6,7,11,12).

Since a different natural habitat is described also for red partridge (*Alectoris Rufa* L.)(RP) in respect either to rock partridge (*Alectoris graeca* M.), chukar partridge and grey partridge (1, 5), we wanted to carry on to 63 days old (age of the widespread transfer to the big flying pens), our studies on the specific nutrient requirement of the intensively-bred RP (4).

MATERIALS AND METHODS

The birds were brooded in battery cages to 5 weeks of age and then housed in wire cages for an additional 4 weeks period. Room temperature and photoperiod were held constant at 23°±2°C and 18L:6D, respectively. The composition and analysis of the 3 experimental diets containing 22.2%, 25.6% and 29.3% crude protein used in this study is given in tables 1 and 2, respectively. 312 one-day-old RP, born on the 4th of June 1988, were divided into 9 groups. Groups 1 to 3 were started on diet A and fed this to 9 weeks of age. Groups 4 to 6 were started on diet B than, one half, fed this to 9 weeks of age, the other half, switched to diet B at 5 weeks of age.

Tab 1. Components of the experimental diets

	DIET A	DIET B	DIET C
corn, yellow grain.....%	51.00	44.50	37.00
soybean meal(44%Prot)..."	28.00	32.50	37.00
fish meal(65%Prot)....."	2.90	5.20	8.90
meat-bone meal(50%Prot)."	3.00	4.50	5.00
alfalfa meal(17%Prot)..."	5.40	4.50	4.00
wheat, shorts....."	5.50	5.00	4.40
fat, vegetal....."	1.00	1.50	2.00
$CaCO_3$....."	0.40	0.30	0.20
$CaHPO_4$....."	1.90	1.20	0.80
NaCl....."	0.15	0.10	0.05
premix (a)....."	0.50	0.50	0.50
anticoccidial drug (b).."	0.05	0.05	0.05
l-lysine....."	0.10	0.05	0.00
dl mentioning....."	0.10	0.10	0.10
Total	100.00	100.00	100.00

(a)premix furnished the following ingredients per kg of feed: vit.A,UI-10000; vit.D_3,UI-2000; vit.B_1,mg-1.5; vit.B_2,mg-3; vit B_6,mg-1.5; vit.B_{12},mg-.015; vit.E,mg-7.5; vit.K,mg-1.5; vit.PP,mg-25; d-pant.acid,mg-8; choline,mg-500; Co,mg-2; Fe,mg-30; I,mg-1.4; Mn,mg-80; Cu,mg-1.5; Zn,mg-30;BHT,mg 50.
(b)amprolium 25%; ethopabate 1.6%; inert c. 73.4%.

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Groups 7 to 9 were started on diet C and at 5 weeks of age one half was switched to diet A and the other to diet B. Health status and dead-bird weight was observed daily. Feed consumption, live weight, tarsus length, remiges length and tail length (measured according to the technique pointed out by Bagliacca et Al,1985)(2,3) were observed weekly. Individual data were analyzed by Least-square analysis considering diet as a categorical or continuous variable. Mortality was analyzed by Chi-square test.

RESULTS AND DISCUSSION

Parameters taken during starter and grower period are given in tables 3 and 4, respectively. RP fed diet A for the first five weeks or more were significantly smaller compared with those fed diet B and C. The analysis of the other parameters (except tail-lenght, which differed between groups only from the 3rd weeks of age) confirmed the results given by the live weights. The analysis of protein content as a continuous variable showed that the best curve fitting the data was a square curve. Calculated best performance, according to the estimated curve were 28.4% to 27.5%, 1st week to the 5st week, respectively.

Tab 3.parameters monitored during the starter-trial

		diet A	diet B	diet C
1 DAY	observations...n	104	104	104
	live weight....g	11.2	11.3	11.2
7 DAYS	observations...n	100	98	101
	live weight....g	20.6 a	23.0 b	23.8 b
	tarsus length.mm	23.9 a	24.5 b	24.6 b
	remiges "...."	38.7 a	41.3 b	41.6 b
	tail "...."	11.9 a	12.0 a	12.2 a
14 DAYS	observations...n	100	96	97
	live weight....g	48.2 a	54.6 b	55.4 b
	tarsus length.mm	31.3 a	32.9 b	33.2 b
	remiges "...."	68.1 a	72.7 b	72.2 b
	tail "...."	29.1 a	30.4 a	29.5 a
21 DAYS	observations...n	98	94	98
	live weight....g	71.0 a	91.0 b	94.8 b
	tarsus length.mm	36.3 a	39.5 b	39.9 b
	remiges "...."	87.9 a	95.7 b	96.4 b
	tail "...."	35.4 a	40.2 b	41.1 b
28 DAYS	observations...n	97	93	93
	live weight....g	103.5 a	130.9 b	134.7 b
	tarsus length.mm	41.2 a	45.3 b	45.3 b
	remiges "...."	102.8 a	109.4 b	110.6 b
	tail "...."	41.6 a	45.7 b	46.2 b
35 DAYS	observations...n	96	91	93
	live weight....g	109.4 a	143.4 b	146.0 b
	tarsus length.mm	41.1 a	45.3 b	46.0 b
	remiges "...."	100.4 a	111.7 b	116.8 b
	tail "...."	36.6 a	42.4 b	44.8 b

(a,b,c) means bearing different letters on the same row are different per P<.05.

Tab 2. chemical composition of exp. diets

	DIET A	DIET B	DIET C
CALCULATED (a.f.b.)			
M.E.(poultry).....MJ/Kg	11.66	11.56	11.40
protein.....%	22.23	25.64	29.34
fat.....%	3.77	4.30	4.77
fibre.....%	5.30	5.23	5.21
ash.....%	7.72	7.88	8.31
Ca.....%	1.17	1.22	1.34
P(total).....%	0.90	0.93	1.01
mentioning.....%	0.56	0.63	0.71
cystine.....%	0.30	0.34	0.38
lysine.....%	1.33	1.54	1.80
tryptophane.....%	0.31	0.35	0.39
threonine.....%	0.84	0.97	1.11
ANALYZED (on d.m.)			
d.m.....%	89.55	89.12	89.35
protein.....%	23.25	26.00	29.60
fat.....%	4.77	5.63	6.10
fibre.....%	7.37	7.43	5.69
ash.....%	8.08	7.86	8.40
Ca.....%	1.39	1.28	1.31
P(total).....%	1.10	1.07	1.18

In the growing period, groups which were switched to diet A showed performances as good as those of groups switched to diet B. However it is interesting to note that there seems to exist a "switching effect".

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Groups B->A, C->A and C->B, in fact, tended to have better performances than B->B groups. A->A groups showed the worse performances during the growing period, probably on account of the inadequate starter feed. Feed conversion data for experimental groups are given in table 5. Birds that were started on diet C (29.3% protein) had slightly better feed conversion through 5 weeks (conv.eff.= 3.2) than groups started on diet B (25.6% protein; conv.eff.= 3.4) or C (22.2% protein; conv. eff.= 3.6), which had the poorest feed conversion; however, the differences were not significant.

Tab 4. parameters monitored during grower-trial

		STARTER-DIET -> GROWER-DIET				
		A->A	B->A	C->A	B->B	C->B
42 DAYS	observation....n	96	46	47	47	46
	live weight....g	141.0 a	186.2 b	187.1 b	170.5 b	184.8 b
	tarsus length.mm	45.4 a	50.0 b	50.3 b	48.3 b	49.7 b
	remiges ".... "	119.2 a	131.2 b	129.8 b	127.1 b	132.8 b
	tail ".... "	46.7 a	53.7 b	53.7 b	53.8 b	57.8 b
49 DAYS	observation....n	96	46	47	47	46
	live weight....g	175.2 a	233.7 b	225.0 b	214.7 b	238.1 b
	tarsus length.mm	49.6 a	54.2 b	53.3 b	51.9ab	53.4 b
	remiges ".... "	129.0 a	144.1 b	140.2 b	142.4 b	146.2 b
	tail ".... "	62.6 a	75.4bc	67.4ab	72.0abc	78.1 c
56 DAYS	observation....n	96	45	47	47	45
	live weight....g	206.3 a	256.1 b	254.1 b	239.4 b	253.2 b
	tarsus length.mm	51.0 a	54.6 b	54.3 b	53.4 b	53.7 b
	remiges ".... "	138.5 a	145.6 b	146.8 b	143.5 b	146.0 b
	tail ".... "	77.5 b	79.3 b	69.7 a	78.9 b	80.5 b
63 DAYS	observation....n	95	45	47	47	45
	live weight....g	237.2 a	286.1 b	282.2 b	265.1 b	278.2 b
	tarsus length.mm	52.2 a	55.7 b	55.0 b	54.1ab	54.3ab
	remiges ".... "	142.3 a	152.0 b	151.0 b	149.3 b	150.4 b
	tail ".... "	87.4ab	84.9ab	76.2 a	86.7ab	89.6 b

(***) means bearing different letters on the same row are different per P<.05.

Tab 5. mortality and feed conversion efficiency observed during the trial.

	STARTER DIET	A	B		C	
1-35 DAYS	mortality.....%	7.7	10.6		10.6	
	conversion eff.	3.6	3.4		3.3	
	GROWER DIET	A	A	B	A	B
36-63 DAYS	mortality'.....%	1.1	2.2	0.0	0.0	2.2
	conversion eff.	5.5	4.7	5.2	5.5	5.4

Feed conversion during weeks 5 to 9 was similar for all dietary groups and no significant differences were noted.

Mortality-rate during days 1 to 35 was lower in group started with diet A than groups B or C; however no significant differences were noted between treatments. 5 through 9 weeks of age mortality rate was very low and did not differ between groups.

CONCLUSIONS

It was evident from our results that feeding diet A (22.2% protein) for the first weeks of age did not sustain adequate growth in RP. Our results indicate however that sustained feeding of high protein diets to growing RP, like Grey partridges, may be not necessary. Good growth can be

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obtained with starter diets containing 25.6% crude protein and this level can be reduced to 22.3% at 5 weeks of age.

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PROTEIN REQUIREMENT OF GROWING RED-PARTRIDGES

A trial was carried out to study red-partridge(RP) protein requirement. Results showed that RP are able to utilize a lower protein feeding (1-35 days crude protein = 27-29%; 35-63 days crude protein = 24-26%) than that necessary for grey partridge growth.

LES BESOINS PROTEIQUE CHEZ LA PERDIX ROUGE

L'étude a été conduite pour mieux connaitre les besoins proteique chez la perdix rouge (PR). Les résultats montrent que la PR est capable d'utiliser un aliment avec un niveau minor de proteine de quel de la Perdix grise (1-35 jours, protéines = 27-29%; 35-63 jours, protéines = 24-26%).

LAS NECESIDADES ALIMENTICIAS DE LAS PERDICES ROJAS

Se realizó un estudio para conocer las necesidades proteínicas de las perdices rojas (PR). Los resultados demostraron que las PR pueden nutrirse con un alimento más bajo en proteínas (1-35 días, proteínas = 27% - 29%; 35-63 días, proteínas = 24% - 25%) que el de las perdices grises.

DER PROTEINBEDARF FÜR WACHSENDE ROTHÜHNER

Untersuchungen zum Proteinbedarf des Rothuhnes wurden durgeführt. Die Ergebnisse zeigen, daß das Rothuhn niedrigreen Proteingehalt benutzen kann (Rohproteingehalt 1-35 Tage: 27% - 29%; 35-63 Tage: 24% - 26%) als dër der für die Wachstumintensität des Rebhuhnes notwending ist.

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Avda. Reina M.ª Cristina, s/n. Tel. (93) 223 99 00
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Fotocomposición: Lasertyp, S.A.
Marco Aurelio, 8, entlo. 3.ª - Tel. (93) 209 14 12
Fotomecánica: Magenta Crom
Mir i Giribert, 8-10 - Tel. (93) 423 98 66
Impresión: Talleres Gráficos Soler, S.A.
Enrique Morera, 15. Tel. (93) 371 31 08
Esplugues de Llobregat (Barcelona-España)

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