INFLUENCE OF DIETARY ENERGY AND PROTEIN LEVELS ON SERUM PROTEIN AND CHOLESTEROL LEVELS IN JAPANESE QUAIL

D. NARAHARI, R. ASHA RAJINI and
I. A. JAYA PRASAD
Department of Poultry Science, Madras Veterinary College, Madras 600 007, India.

FEW workers have reported the serum protein[1] and cholesterol[2] levels in Japanese quail. These levels are influenced by age[1], sex[1–3] and dietary fibre level. But no studies are available on the influence of dietary energy and protein levels on serum protein and cholesterol levels of Japanese quail. Hence this study was conducted to determine such an association if any.

Two independent experiments were conducted, each involving 240 Japanese quail chicks. In one experiment the quail chicks were fed *ad libitum* with diets containing 22, 24, 26 and 28% crude protein (CP) with a constant metabolizable energy (ME) levels of 2,800 kcal/kg diet from 0 to 3 weeks of age. This was followed by 18, 20, 22 and 24% CP respectively, with a constant 2,600 kcal of ME/kg diet from 4 to 6 weeks of age.

In the second experiment the CP levels between treatments were uniform at 26 and 20% levels during 0–3 and 4–6 weeks of age respectively; but the ME levels varied as 2,400, 2,600, 2,800 and 3,000 kcal/kg during 0–3 weeks of age, followed respectively by 2,200, 2,400, 2,600 and 2,800 kcal of ME/kg diet from 4 to 6 weeks of age.

Table 1 *Effect of dietary protein and metabolizable energy level on serum protein and total cholesterol levels in Japanese quail at six weeks of age*

	Mean with S.E.					
	Serum protein (g/100 ml)			Serum total chol. (mg %)		
Treatment	Male	Female	Mean for treatments (NS)	Male	Female	Mean for treatments (NS)
Experiment I: % C.P.:						
22/18	3.50	4.31	3.91	183.1	197.0	190.1
	0.14	0.19	0.18	1.39	1.63	1.57
24/20	3.55	4.42	3.99	185.2	196.3	190.8
	0.16	0.21	0.17	1.63	0.78	1.36
26/22	3.63	4.46	4.05	183.4	198.2	190.8
	0.18	0.24	0.22	2.27	2.67	2.20
28/24	3.52	4.45	3.99	183.7	196.9	190.3
	0.16	0.18	0.17	3.00	1.39	2.65
Mean for sexes**	3.55^a	4.41^b	–	183.9^a	197.1^b	–
	0.15	0.20		1.61	1.57	
Experiment II: M.E. (kcal/kg):						
2400/2200	3.42	4.52	3.97	182.3	195.7	189.0
	0.18	0.21	0.16	1.65	0.92	1.36
2600/2400	3.54	4.34	3.94	183.2	195.3	189.3
	0.20	0.22	0.18	1.63	2.25	2.06
2800/2600	3.45	4.44	3.95	185.6	198.3	192.0
	0.16	0.18	0.18	1.53	2.07	1.89
3000/2800	3.58	4.40	3.99	186.4	198.9	192.7
	0.22	0.18	0.19	2.17	1.20	1.68
Mean for sexes**	3.50^a	4.43^b	–	184.4^a	197.1^b	–
	0.19	0.16		1.51	1.39	

** Mean within each category bearing different superscripts differ significantly ($P < 0.01$); NS: Not significant.

At six weeks of age, 10 male and 10 female quail chicks from each treatment, making a total of 80 chicks in each of the two experiments, were slaughtered for further study. While slaughtering, individual blood samples were collected from the jugular vein and the serum was separated. Samples of serum were assayed for their protein[4] and total cholesterol[5] contents. The data were evaluated statistically[6] for significance.

The results (table 1) revealed no significant differences between treatments for both the blood parameters studied. However, highly significant ($P < 0.01$) sex differences were noticed for both serum protein and total cholesterol levels. Irrespective of the dietary protein and ME levels, females recorded significantly ($P < 0.01$) higher serum protein and cholesterol levels than males at six weeks of age, which agrees with earlier findings[1-3].

The results exhibited no correlationship between dietary CP and ME levels and the serum protein level.

The results suggest that the serum protein level in six-week-old Japanese quail was independent of the dietary CP and ME levels. The total serum cholesterol level was also not influenced by the dietary CP level. Although a slight increase in the serum cholesterol content was noticed with increasing dietary ME levels, it did not differ significantly.

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1. Atwal, L. S., Mc Farland, L. Z. and Wilson, W. O., *Poult. Sci.*, 1964, **43**, 1392.
2. Joshi, H. B., Singh, H. and Dimri, C. S., *Avian Res.*, 1982, **66**. 4.
3. Viswanathan, S., Thangavel, A. and Rao, R. G., *Proc. X Annual Poult. Symp.*, Madras Vet. College, Madras, 1983, p. 108.
4. Huerga, D. L., Smetters, G. W. and Sherrick, J. C., *Serum proteins and dysproteinemias*, (ed.) F. W. Sunderman, Thomas Publishers, Springfield, Illinois, 1964.
5. Ferro, R. V. and Ham, A. B., *Am. J. Clin. Pathol.*, 1960, **33**, 545.
6. Snedecor, G. W. and Cochran, W. G., *Statistical methods*, 6th edn., Oxford and I. B. H. Publishing Co., Calcutta, 1967.

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