

EFFECT OF DIETARY FAT COMPOSITION ON IN VITRO CHOLESTEROL SYNTHESIS
IN HEPATIC TISSUE OF JAPANESE QUAIL

R.L. HOOD

Japanese quail was chosen as the laboratory animal for studies on the influence of dietary fat on cholesterolemia. Quail are small omnivorous animals weighing 110-140g and consume only 14g of feed per day. They have a short life cycle, are resistant to most diseases and respond favourably to experimental manipulations. Most importantly, Japanese quail, especially the male, are very susceptible to atherosclerosis, spontaneous or induced by cholesterol feeding. Quail atherosclerosis is histologically similar to the disease in other experimental animals and in humans (Shih 1983).

A comparison of acetate, mevalonate, glucose or water as radioactive substrates for the hepatic synthesis of cholesterol was made in Japanese quail (*Coturnix coturnix japonica*) fed diets containing either beef fat or tuna oil. Quail fed a diet containing beef fat were fatter and had a higher concentration of serum cholesterol than quail given tuna oil. In vitro cholesterol synthesis was greater in quail fed a beef diet than in those fed a diet containing tuna oil. Mevalonate was the preferred radioactive substrate to quantitate cholesterol synthesis.

In a second experiment Japanese quail, eight per treatment group, were fed diets containing either beef fat, tuna oil, safflower oil or linseed oil. Results are shown in the Table.

	Dietary treatment			
	Beef	Tuna	Safflower	Linseed
Liveweight (g)	150	141	160	138
Serum triacylglycerols (mmol/l)	2.3	1.6	2.2	1.2
Serum cholesterol (mmol/l)	5.4	3.0	4.9	4.5
Cholesterol synthesis ¹	113.0	22.7	64.3	52.8

¹nmoles mevalonate converted to cholesterol/g liver/h.

Rate of cholesterol synthesis was significantly lower ($P < 0.05$) in the quail fed tuna oil when compared to other groups and this was also reflected in the serum cholesterol concentration. Tuna oil and linseed oil, which both contain ω -3 fatty acids, were both effective in reducing serum triacylglycerol concentration.

SHIH, J.C.H. (1983). *Fed. Proc.* 42:2494.

CSIRO, Food Research Laboratory, North Ryde, New South Wales 2113