

## VARIABILITY IN THE CHOLESTEROL RESPONSE TO CASEIN IN RABBITS.

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The cholesterolaemic response of rabbits to dietary cholesterol is varied with some animals classified as non-responders. This has been partly attributed to a genetic trait (Roberts et al. 1974). However, the variation in the cholesterolaemic effect of dietary protein in rabbits has not been documented. This paper reports such variation and the occurrence of non-responding animals.

In the course of determining whether the hypercholesterolaemic effect of casein is a trace element effect, we fed three groups of rabbits (male, Castle Hill Laboratory Whites) similar cholesterol-free diets with casein as the protein source (25% w/w). The diets differed in their mineral composition. Diet A (control diet) consisted of 4% mineral mix (Phillips-Hart) and Diet B consisted of 2.5% minerals. Diet C contained 2.5% minerals as in B but the amounts of copper and zinc were replenished to those found in Diet A (3.6 $\mu$ g/g and 13.3 $\mu$ g/g respectively). Blood was collected fortnightly for 12 weeks and plasma total cholesterol assayed (CHOD-PAP).

Table 1. Plasma cholesterol after 12 weeks on diet.

Diet	n	Plasma cholesterol (mmol/l)	
		mean	$\pm$ sem
A	6	3.32	$\pm$ 1.15 (a) (b)
B	6	7.51	$\pm$ 1.23 (a) (c)
C	9	5.06	$\pm$ 1.40
C(i)	5	1.78	$\pm$ 0.21 (c) (d)
C(ii)	4	9.15	$\pm$ 1.27 (b) (d)

Numbers showing same superscript are significantly different using Students' t test. (a)  $P < 0.05$ , (b)  $P < 0.02$ , (c)  $P < 0.01$  and (d)  $P < 0.001$ .

Although there was individual variation in response within groups to Diets A and B, the mean plasma cholesterol was significantly higher in group B. However, the group fed C showed a bimodal response and it was possible to divide this group into 2 significantly different subgroups ( $P < 0.001$ ). In one group, C(i), the mean plasma cholesterol was similar to that of the control group (A) and in the other, C(ii), significantly higher. Conversely, compared to those fed Diet B, the mean plasma cholesterol of C(ii) was similar and C(i) significantly lower.

Thus upon replenishment of part of the mineral mix, some rabbits responded as for the control group (A) and some as for the reduced salts group (B). This is comparable to observations on non-responding cholesterol-fed rabbits and may be useful as a model for determining the mechanism of casein-induced hypercholesterolaemia. Furthermore, the increased plasma cholesterol seen when the mineral content is reduced (B), and the resultant decrease in plasma cholesterol in a subgroup of rabbits (Ci) when copper and zinc are restored to control levels indicates an interaction between minerals and the casein-induced hypercholesterolaemia which deserves further investigation.

ROBERTS, D.C.K., WEST, C.E., REDGRAVE, T.G. and SMITH, J.B. (1974)  
Atherosclerosis. 19: 369.