

LIPOPROTEIN AND STEROL METABOLISM IN VEGETARIANS

P. NESTEL[†] and T. BILLINGTON[†]

Vegetarians (V) have lower plasma lipid and lipoprotein levels than omnivorous individuals (Burslem et al 1978) and may thus be less prone to premature coronary disease. Phillips et al (1978) have demonstrated decreased mortality from coronary heart disease in Seventh Day Adventists (SDA), a group practising vegetarianism. We therefore determined lipoprotein protein turnover and sterol balances in 7 SDA men (V) 21 - 42 yr., 55-65 kg, and a similar control omnivorous group (C). The V who did not eat eggs or dairy fat, derived 25% energy from fat and over 60% energy from carbohydrate, mainly starch. C derived 40% energy from animal fat. Low density lipoprotein (LDL) and high density lipoprotein (HDL) kinetics were calculated from 2-pool analysis of apoprotein B-¹³¹I and apoprotein A₁-¹²⁵I specific activity-time curves after intravenous reinjection of iodinated lipoproteins. Faecal neutral and acid steroid excretion were measured over 8 days for sterol balance.

The following lipids were lower in V than C:- (mean ± S.D.)

	Plasma apo A ₁	Plasma Cholesterol (CH)	LDL CH	LDL apo B
V	99 ± 18 ^X	140 ± 18*	87 ± 21*	57 ± 14
C	120 ± 21	190 ± 20	123 ± 28	84 ± 20

^X p < 0.1, * significantly lower, p < 0.05

Kinetics of LDL apo B, pool 1, showed in V versus C smaller mass (1.54±0.43 g vs 2.06±0.41), reduced synthesis (9.1±2.3 mg/kg/day vs 11.8±0.6)* and similar fractional catabolic rate (FCR) (0.027±0.018 hr⁻¹ vs 0.023±0.004). HDL apo A₁ kinetics showed for pool 1, smaller mass (2.77±0.36 g vs 3.01±0.51) similar synthesis (10.5±1.5 mg/kg/day vs 11.8±1.8) and elevated FCR (0.043±0.011 hr⁻¹ vs 0.027±0.011)*. Sterol balances in V versus C were: CH synthesis 10.1±2 mg/kg/day vs 11.3±2.9; bile acid synthesis 3.2±1 mg/kg/day vs 3.8±0.9*. We conclude that in vegetarians:

1. Low apo B synthesis and low plasma CH may be due to low animal fat intake.
2. Low apo A₁ results from high removal rate, perhaps related to high carbohydrate intake.
3. Bile acid excretion was reduced despite high fibre intake.

BURSLEM, J., SCHONFELD, G., HOWALD, M.A., WEIDMAN, S.W., MILLER, J.P. (1978) *Metabolism* 27 : 711.

PHILLIPS, R.L., LEMON, F.R., BEESON, W.L., KUZMA, J.W. (1978) *Am. J. Clin. Nutr.* 31 : 191.

[†] Cardiovascular Metabolism and Nutrition Research Unit
Baker Medical Research Institute
Prahran, Victoria, 3181