Dear Editors,

Professor Dahlén’s blank statement that diet has a negligible effect on lipoprotein (a) (Lp(a)) levels [1] is correct for conventional lipid-lowering diets, which lower low density lipoprotein (LDL) and sometimes high density lipoprotein (HDL) levels, but hardly affect Lp(a). There is, however, an interesting exception in the form of dietary trans fatty acids, which are unsaturated fatty acids with one or more double bonds in the trans instead of the more usual cis configuration. Intakes in various populations range from 1–10 g per day. Three studies in 2 laboratories have shown that trans fatty acids raise Lp(a) in man.

Nestel et al. [2] fed 27 mildly hypercholesterolemic men diets enriched with 5%–7% of energy from palmitic acid, oleic acid or trans monounsaturated fatty acids for 3 weeks, and measured Lp(a) by radioimmunoassay. Mean Lp(a) levels (±SD) were 296 ± 220 U/l on the trans fatty acid diet, 249 ± 204 U/l on the palmitic acid diet (P < 0.001) and 236 ± 201 U/l on the oleic acid diet (not significant).

We fed 10% of energy as cholesterol-raising saturated fatty acids (lauric, myristic, palmitic acid), as oleic acid, or as trans monounsaturated fatty acids to 59 normocholesterolemic volunteers for 3 weeks each, in random order. The median level of Lp(a), measured by enzyme linked immunosorbent assay (ELISA), was 45 mg/l on the trans fatty acid diet, 26 mg/l on the saturated fat diet (P < 0.001), and 32 mg/l on the oleic acid diet (P < 0.02) [3]. Fig. 1 shows the distribution of Lp(a) levels on the trans and the saturated fat diets. Lp(a) was higher on the trans diet in 47 out of 59 subjects.

Our second study involved 56 subjects, who received 8% of energy from stearic acid, linoleic acid, or trans monounsaturates, for 3 weeks each. Median Lp(a) levels were 85 mg/l on the trans fatty acid diet and 69 mg/l on both the stearic acid and the linoleic acid diets (P < 0.01) [3].

Trans fatty acids thus appear to be one of the rare lifestyle and dietary factors that affect Lp(a) levels, even though the effect is modest relative to...
Fig. 1. Distribution of serum Lp(a) levels in 59 volunteers after they had received diets high in lauric, myristic and palmitic acid (grey bars) or high in trans monounsaturated fatty acids (black line) for 3 weeks, in random order [3,4]. Subjects are ranked from left to right by their level on the diet rich in saturated fatty acids.

Genetically determined differences. These dietary studies also confirm that metabolic control of Lp(a) is independent of that of LDL, as pointed out by Dahlén [1]. Both trans fatty acids and saturates raised LDL, but trans fatty acids raised Lp(a) while saturates tended to lower it. The effect of trans fatty acids on Lp(a) should thus be of metabolic interest even if its public health impact may be modest.

References