

## Dietary Fat Quality in Human Nutrition-An Update

Martijn B. KATAN

Department of Human Nutrition, Agricultural University, Bomenweg 2,  
6703 HD Wageningen, The Netherlands

Severe dyslipoproteinemia cannot be cured by diet. However, dietary measures are suitable for correcting moderate hyperlipoproteinemia, and will allow lower drug doses in the treatment of severe hyperlipoproteinemia. Effects on the various lipoprotein classes are reviewed below.

LDL. LDL cholesterol and apoB levels are reduced when intake of saturated fatty acids, notably lauric, myristic and palmitic acid, is reduced. Under isocaloric metabolic-ward conditions, replacement of saturates by (n-6)polyunsaturates is slightly more effective than monounsaturates, which in turn are slightly superior to carbohydrates. Dietary cholesterol raises LDL, and cholesterol interacts with saturates: the effect of diets high in both cholesterol and saturates exceeds the sum of their separate effects. Trans-fatty acids raise LDL-cholesterol. Fish oils also tend to raise LDL and apoB somewhat. Coffee beans contain a lipid that raises LDL, and may also affect VLDL. This lipid is extracted by hot (95-100°C) water but does not pass a paper filter. Soluble fibre such as found in fruits, vegetables, and oat bran has a specific though small cholesterol-lowering effect. In the obese, reductions in body fat can markedly lower LDL.

HDL and VLDL. Under conditions of constant body weight replacement of fat by carbohydrates lowers HDL and raises VLDL and total triglycerides. However, weight reduction will counteract these effects; the final effect of low-fat high-carbohydrate diets will thus depend on the degree of weight loss. Dietary cholesterol raises HDL. Trans fatty acids lower HDL and may increase triglycerides. Fish oils very effectively lower triglycerides. HDL rises with alcohol intake.

Lipoprotein(a). Saturated fat and cholesterol do not raise lp(a), but trans fatty acids do. The effects of fish oil and weight reduction are still equivocal.

Optimal diets. Optimal diets are low in dairy fat, high-fat meats and sausages, tropical fats, hydrogenated oils, and cholesterol. Preferred foods are legumes, lean meats, fish, low-fat dairy products, vegetables, fruits, bread, pasta, cereals, soft margarines, and oils high in mono- and polyunsaturates. A lasting weight reduction is desirable but hard to achieve. The success of dietary treatment is critically dependent on frequent reinforcement by e.g. a dietician. Success will also depend more and more on the availability of suitable foods in restaurants and as convenience foods, because the number of people who prepare their own foods is decreasing.