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Response Surface Analysis for Effect of Dietary MUFA on Plasma Cholesterol Levels in Rats

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Introduction : Recently it has been reported that dietary MUFA may reduce the plasma "bad-cholesterol" concentration, but the hypocholesterolemic effect of MUFA has not been studied well yet. Especially, no reports of synergic effects on plasma cholesterol-reducing between MUFA and SFA were studied. This study was carried out to examine the effect of dietary MUFA on plasma cholesterol concentration.

Materials and methdos : Male Sprague Dawley rats were fed diets which have different MUFA (22-40%) and SFA (18-51%) levels for 3 weeks. Fatty acids in plasma and cholesterol fraction were determined, and then all data were carried out Response Surface Multiple Regression Analysis with computer statgrafic program.

Results : When to the dietary MUFA level increased, MUFA/SFA ratio in plasma, TG, LDL·VLDL-C and TC concentrations tended to rise, but HDL-C/TC ratio decrease ($P<0.05$). There was no synergic effect between MUFA and SFA on plasma cholesterol-lowering. Therefore it could be suggested that dietary MUFA had no hypocholesterolemic effect in plasma.

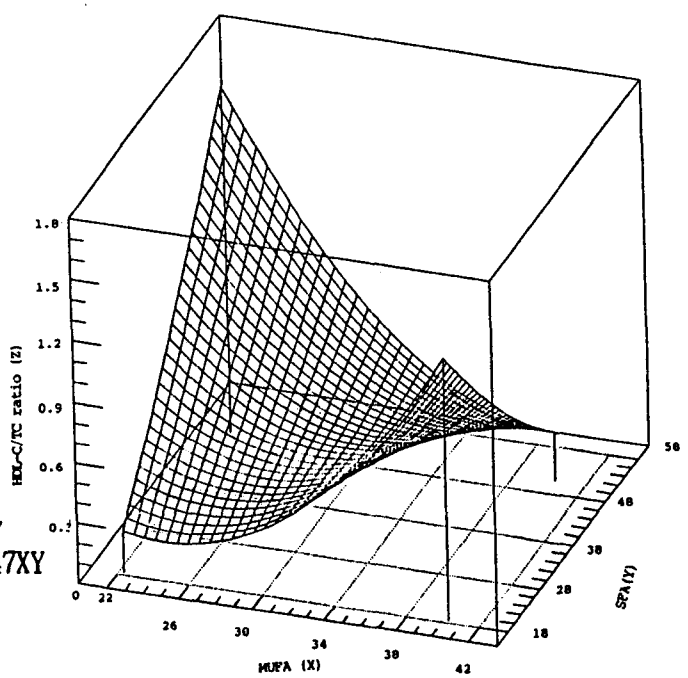

Figure : Three dimensional plot of plasma HDL-C/TC ratio as a function of dietary MUFA and SFA.
$Z=0.477282 - 0.139788\ X + 0.124767Y + 0.004499X^2 + 0.000257Y^2 - 0.004347XY$
($r^2 = 0.8301$)

References : 1. Grundy, S.M. Engl. J. Med. 314:745-748, 1986.
2. Grundy, S.M. J. Nutr. 119:529-533, 1989.
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Key words : Monounsaturated fatty acids, Lipid, Cholesterol, Response Surface Analysis