SUPPLEMENTATION WITH BETA-CAROTENE: COMPARISON OF NATURAL AND SYNTHETIC FORMS AND ADDED RETINYL PALMITATE:

C.B.PINNOCK and N.R.BADCOCK*

Beta-carotene (BC) is being used extensively in Phase II chemoprevention trials, however the parameters of supplementation (dose, duration, source of material and response rates) vary widely. These issues were considered in an 8 week randomized controlled trial of BC supplementation at two different dose levels, from natural and synthetic sources, and with added retinyl palmitate. The effect of supplementation on plasma levels of ß-carotene, retinol and buccal mucosal retinol levels is reported.

Fifty six subjects were randomized into 4 treatment groups: A natural ß-carotene: 15mg/day; B. synthetic ß-carotene: 30 mg/day; C. synthetic ß-carotene: 30 mg/day + retinyl palmitate (RP)1.5 mg retinol equivalents/day; D. Placebo. Plasma BC increased by 0.29, 0.79 and 0.55 µmol/l in groups A,B,C respectively, with the placebo group showing a slight decrease. Response to the natural form was only 72% of that expected, suggesting that the natural form, which contains a higher proportion of cis isomers, is less well absorbed than the all trans synthetic form. This is consistent with reports from other studies (Jensen, 1987). Addition of retinyl palmitate did not significantly enhance response to BC, although the proportion of skin yellowing was greater in this group.

Neither buccal cell nor plasma retinol levels were changed in response to supplementation. A high proportion of individuals in all supplemented groups had responses <0.1µmol/l. This is consistent with other studies, which have recorded erratic responses over short periods of supplementation (Dimitrov, 1986,1988). Longer supplementation times are necessary to obtain optimal results.

JENSEN C.D., HOWES T.W., SPILLEN G.A., PATTISON T.S. and WHITTAN J.H. (1987) Nutr Rep Int 35:413-422.
DIMITROV N.K., MEYER C., ULLREY D.E. , CHENOWETH W., MICHELAKIS A., MALONE W., BOONE C.W. and FINK G. (1988) Am J Clin Nutr 48:298-304.
DIMITROV N.V., BOONE C.W., HAY M.B., WHETTER P., PINS M., KELLOFF G.J., and MALONE W. (1986) J Nutr Growth and Cancer 3:227-237.

Repatriation Hospital Daw Park, Daw Park, South Australia 5041.
* Department of Chemical Pathology, Adelaide Children's Hospital, Adelaide, South Australia 5006.