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EFFECT OF HEATING AND OF THE ADDITION OF VEGETABLES AND FRUIT ON MUTAGENICITY AND CARCINOGENICITY OF HUMAN DIETS.

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Five diets were tested on mutagenicity and carcinogenicity, a semisynthetic animal diet, an animal diet to which vegetables and fruit were added and three human diets, with raw products, with heated products and with heated products to which vegetables and fruit were added. Animal diets consisted of 21.6 Energy (E) % fat, 26.0 E % protein, 52.4 E % carbohydrate and 10.7 % (w/w) fibre. For human diets these figures were 40.6, 13.2, 46.2 and 5 % respectively.

Human diets with heated products were clearly mutagenic in the Salmonella-microsome test, tester strains TA 1538, TA 98 and TA 100 (300-500 revertants per gram). HPLC-derived chromatographic fractions of these diets showed 3 large mutagenic areas identified as IQ, $MeIQ_x$, $DiMeIQ_x$ and PhIP. Estimates for these heterocyclic amines amounted to 15-20 µg/kg. Food pellets from animal diets displayed no mutagenic activity (1). Male Wistar rats (but not female) fed the human diet for 142 wk had a significantly higher incidence of epithelial tumours than those fed the animal diet. This increase was mainly due to tumours of the pituitary and thyroid. Frying and baking of food products or the addition of vegetables and fruit induced minor differences in tumour rate, which were not statistically significant (2).

1. G.M. Alink et al. (1988) Mutation Res., 206, 387-393

2. G.M. Alink et al. (1989) Food Chem. Toxicol., 27, 427-436