

NUTRITIONAL EVALUATION OF RUMINANT-DERIVED MEAT, MILK AND
DAIRY PRODUCTS CONTAINING ELEVATED LEVELS OF LINOLEIC ACID

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In recent years it has become commercially feasible to produce such foodstuffs as beef, lamb, milk and dairy products in which the fat contains a much higher level of linoleic acid (e.g. 20% of the fatty acids) than that of the corresponding conventional foodstuffs, which usually contains only 2 to 4% of linoleic acid (McDonald and Scott, 1977). These foods are produced by feeding ruminant livestock a supplement in which a suitable polyunsaturated oil (e.g. sunflower seed oil) is encapsulated within a protein matrix modified by reaction with formaldehyde. (Scott *et al* 1971, Pan *et al* 1972). The fat is protected against hydrogenation in the rumen, but is subsequently released in the abomasum for absorption into the tissues and milk of the animals.

During the development of these new foods, several clinical and nutritional evaluations of the products were undertaken. Included in these were studies in which groups of mice or rats were fed on ordinary laboratory feeds (N), or on freeze-dried human diets based either on conventional foodstuffs from ruminants (C diet), or on the corresponding linoleic acid-enriched foods (P diet).

Mice of the Quackenbush strain were used in three studies; a preliminary trial to establish that growth rates on the diets C and P were satisfactory, followed by two reproduction and longevity studies. The growth rates and lifespans of the mice on the two human diets C and P were found to be similar to those of mice on diet N. The reproductive productivity of the mice on C and P diets was initially lower than that of mice on diet N, but returned to the same level as the latter over the course of the study. For this strain of mouse, there were no differences in growth rate, longevity or reproductive productivity between the mice receiving the linoleic acid-enriched diet P and those fed the conventional human diet C.

Groups of female mice of the tumour-prone C3H strain were also fed the three test diets N, C and P. After a nine week mating period, the female parent mice were observed for the incidence of mammary tumours. There were no significant differences in overall reproductive productivity or longevity between the three groups, and there were no significant differences between the three groups in regard to the numbers of mice which developed tumours.

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