MUTAGENECITY OF TOMATO PRODUCTS

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The incidence of diseases such as colo-rectal cancer and ishaemic heart disease, which are thought to be diet related, is higher in Greeks in Australia than Greeks in Greece. The transition to an affluent western diet is a probable cause (McMichael 1983).

A change in the handling of foods may also have some significance in the increased cancer incidence in Australia. An observation from an investigation of food intake patterns of Greek Migrants in Australia (Wahlqvist et al. 1983), noted the change in tomato paste preservation in households of Greek Migrants. Generally in Greece, tomato paste is protected from mould contamination by the application of an overlay of oil. This procedure does not appear to be widely practiced in Australia and when paste is contaminated by mould, it is removed and remainder paste is used.

Our study involves the testing of tomatoes and tomato products for mutagenicity. The presence of mutagens in tomatoes and tomato products could contribute to the incidence of cancer.

We have used the Ames Salmonella/Microsomal mutagenicity assay (Ames et al. 1975) to screen the tomatoes and tomato product samples for mutagenic properties. Because of the possibility that the sample extract could contain histidine, which would lead to false positive results with this test, we decided to use the Ara^S Forward Mutation assay (Ruiz-Vazquez et al. 1978) which eliminates this problem.

Samples of sterile commercial paste and paste with fungus were tested for mutagenicity (with and without metabolic activation). The strain used was SV-21. The Table shows the preliminary results from 3 experiments, in duplicate, indicating the number of revertant colonies per plate.

	CONTROL+	STERILE PASTE		FUNGUS PASTE		POSITIVE CONTROL++
		Heat treated	Non-heated treated	Heat treated	Non-heated treated	
		(colonies per plate)				
Metabolic activation	35.25	48.00	89.75	65.50	58.00	118.00
No metabolic activation	37.75	210.33	221.33	61.50	57.83	48.50

+ Control contains distilled water as test sample.

++ 2-Acetylaminofluorene

The results of this study suggest the presence of non-heat labile mutagenic substances in sterile commercial tomato paste which appear to be inactivated by fungal growth and by rat liver microsomal enzymes.

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