

## Citrus Extract and Human Lipids

J.A. Vinson, 1988.

Eight college age students, four males and four females, average age 21 years, participated in the study with informed consent. In a double blind protocol, neither the subjects nor the analyst knew which supplement they were taking. The subjects were given either Citrus Extract alone or 25.1% bound Ascorbic Acid to the Citrus Extract. Each subject took 2 grams of supplement orally twice a day in orange juice. The ascorbate content of the citrus extract was 1000 mg/daily.

Each subject was sampled fasting before and after 2 months of supplementation. Plasma was collected and analysed for total cholesterol and high density lipoprotein cholesterol (HDL) by an enzymatic UV method. The results are shown in the following table.

Group	Baseline		1 Month		2 Months	
	<u>Cholesterol</u>	<u>HDL</u>	<u>Cholesterol</u>	<u>HDL</u>	<u>Cholesterol</u>	<u>HDL</u>
Citrus Extract	224 ± 65	35.5 ± 16	194 ± 19	55.8 ± 10.2	164 ± 30	61.3 ± 13.9
Citrus Extract with Ascorbate	188 ± 22	63.5 ± 6.6	185 ± 12	54.7 ± 7.4	166 ± 41	57.8 ± 6.4
Combined	206 ± 49	49.5 ± 18.6	190 ± 16	55.3 ± 8.3	165 ± 33	59.5 ± 10.1

There was no significant difference between the two groups so the results were combined. For the combined groups there was no significant difference between the baseline and one month values. However, after two months a significant decrease in cholesterol was observed ( $p < 0.05$ ). HDL was not significantly changed after one month, but was after two months ( $p < 0.05$ ). The decrease in cholesterol was 20% corresponding to a 40% decrease in heart attack risk. Thus overall, an 80% decline in risk in heart attacks occurred due to citrus extract supplementation.

