

## INFLUENCE OF UNREFINED SORGHUM OR MAIZE ON SERUM LIPIDS

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**Received: 17 September, 1990**

**Accepted: 10 December 1990**

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**ABSTRACT:** *The rural population in many parts of India consumes sorghum (Jowar) and maize as staple food. The flour made out of these cereals is consumed after cooking or baking on a pan with or without oil. The present study was undertaken in two groups of healthy human volunteers. Each subject of first group consumed ground unrefined sorghum (100g) daily as supper for three weeks in the form of pancake. The subjects of second group consumed ground unrefined Maize (50g) daily as supper for three weeks also as pancake. Both the diets showed significant reduction in serum total cholesterol and triglyceride levels with simultaneous increase in HDL cholesterol value.*

### INTRODUCTION

Dietary fibre plays an important role in normal gastro-intestinal physiology and its lack in the diet may be important in the pathogenesis of a number of gastrointestinal disorders. Fibre has been implicated in excretion of such substances as bile acids, fats including cholesterol and minerals<sup>1-3</sup> due to its potential for binding. The beneficial effect of dietary fibre in reducing serum lipids has been well known<sup>4</sup>. However, the extent of effectiveness varies depending upon the kind and amount of fibres<sup>5</sup>. Studies using refined fibres like isabgol, pectin etc. revealed that they reduce serum lipids and cholesterol. The present study aims at investigating the influence of unrefined sorghum and maize which are the staple food of the people belonging to lower socio – economic group in this region, on serum lipids.

### MATERIALS AND METHODS

Volunteers of either sex (6 males and 10 females) in the age group of 23- 26 years were included in the study after obtaining their informed consent. Their blood pressure was normal and none had any gastrointestinal complaint. The subjects were divided into two groups. Each subject of group I (4 males and 4 females) was given enough sorghum flour for consumption of 100 g | daily as supper in the form of pancakes without oil for 3 weeks. Similarly each volunteer of group II (2 males and 6 females) consumed maize 50 cakes without oil for 3 weeks. All subjects have been requested not to consume eggs and other cholesterol boosting food stuff (even restrained from attending dinners) during the study period. 10 ml blood samples were collected from the antecubital vein at the beginning and after 3 weeks.

The samples were collected in the early hours of the day before breakfast; serum was separated immediately by centrifugation and stored at 20°C until analyzed. Serum total

cholesterol, triglycerides and HDL cholesterol levels were determined by Bloor's<sup>6</sup>, Gohfried's<sup>7</sup> and phosphotungstic acid|Mg<sup>+28</sup> methods respectively.

**TABLE 1**

**Mean (± S. D.) levels of serum lipids (n = 8)**

Diet	Total cholesterol		Triglycerides (mg/dl)		HDL cholesterol (ng/dl)	
	Before	3 Weeks after	Before	3 Weeks after	Before	3 Weeks after
Sorghum (100 g/day)	206.6 ± 51.7	160.9 ± 61.6	94.9 ± 43.8	71.5 ± 35.7	17.8 ± 17.8	32.6 ± 13.5
Maize (50 g/day)	227.2 ± 13.1	152.8 ± 31.0	96.4 ± 17.3	54.7 ± 12.9	14.3 ± 2.82	35.0 ± 15.7

## RESULTS

The levels of total cholesterol, triglycerides and HDL cholesterol are given in Table – 1.

The mean total cholesterol and triglycerides were reduced significantly (P<0.05) with a marked increase in HDL cholesterol levels following consumption of both the diets for 3 weeks.

## DISCUSSION

There has been evidence for the use of dietary fibre in various diseases. Many investigations were undertaken using fibrous material in relatively pure form. Nakamura **et al**<sup>9</sup> have reported that pectin and isabgol

reduced cholesterol and serum lipids considerably. Similarly Goswami<sup>10</sup> in another study conducted in 14 subjects reported that there is about 10% reduction in total serum cholesterol. The cereals sorghum and maize are normally subjected to refining by grinding and screening, which results in reduction in fibre content (particularly insoluble fibre). Our study using unrefined jowar and maize revealed that they are beneficial in reducing the total cholesterol and triglycerides. Of the two, maize appears to be more effective. Another useful effect of these fibre – rich diets is that they resulted in increase of HDL cholesterol levels.

## REFERENCES

1. Cummings, J. H., *Gut.*, **14**, 69 (1973).
2. Zilversmit, D. B. **Nutrition, lipids and coronary artery diseases', A Global view**, Reven Press, New York, 1 (1979).
3. Mendeloff, A. I., **Nutr. Rev.**, **33**, 321 (1975).
4. Trowell, H. C., **Proc. Nutr. Soc.**, **32**, 151 (1973).
5. Jenkins, D. J. A. **Lancet. II**, 1287 (1979).
6. Jaya Raman, **Laboratory Manual in Biochemistry**, Wiley Eastern Ltd., New Delhi, 96 (1981).
7. Gofffried, S. P. and Rosenberg, B., **Clin. Chem.** **19**, 1077 (1973).
8. Burnstein M., Schonick, H. R. and Morin, R. J. **Lipid Res.** **19**, 583 (1978).
9. Nakamura **et al.** **Nutr. Rep. Int.**, **26**, 215 (1982).
10. Goswami, S., **Ancient Sci. Life**, **7**, 164 (1988).