

MANIPULATION OF PLASMA CHOLESTEROL IN MAN AND ITS SUPPRESSION
BY WHEAT FIBRE

P. LETCHFORD*, R. ZABROJA*, J. ARTHUR and D.J. FARRELL*

We showed previously that plasma cholesterol in man declined following addition of wheat bran to the diet (Farrell *et al.* 1978). In the present study we manipulated plasma cholesterol by recommending dietary changes, and then superimposed wheat fibre as bran to determine effect on cholesterol levels.

Seventeen volunteers (12 females and 5 males) aged less than 40 years were divided into two groups on the basis of an initial plasma cholesterol determination following an overnight fast. Concentration was measured using an enzymatic method (Calbiochem) in a Centrifichem System 400. Six subjects with a cholesterol level below 6.2 m mol l^{-1} were placed on a high-cholesterol diet by recommending frequent consumption of foods known to be high in cholesterol. Others, with levels above 6.2 m mol l^{-1} , were asked to avoid foods high in cholesterol. Participants kept a diary of foods consumed each day. From the end of week 3 to the end of week 5 all subjects took 12 g/d of wheat bran in equal amounts at each meal. After week 5 the subjects reverted to their pre-experimental unspecified diet. Venous blood samples were taken after 1, 3, 5 and 12 weeks.

Inspection of diaries indicated that subjects generally adhered to the dietary recommendations. Results are given in Table 1.

TABLE 1. Mean (\pm SEM) plasma cholesterol concentrations (m mol l^{-1}) of 11 subjects on a low-, and 6 subjects on a high- cholesterol diet. Bran (12 g/d) was taken from week 3 to week 5.

Diet	Weeks on Experiment				
	0	1	3	5	12
Low cholesterol	$7.4 \pm 0.2^{\text{a}*}$	$6.5 \pm 0.2^{\text{b}}$	$6.5 \pm 0.3^{\text{b}}$	$5.8 \pm 0.2^{\text{c}}$	$6.6 \pm 0.3^{\text{b}}$
High cholesterol	$5.2 \pm 0.2^{\text{e}}$	$5.5 \pm 0.1^{\text{e}}$	$6.6 \pm 0.4^{\text{b}}$	$5.2 \pm 0.3^{\text{e}}$	$5.0 \pm 0.2^{\text{e}}$

*a-e Values within a column or row with a different superscript are significantly different ($P < 0.05$)

The dietary recommendations had the desired effect in changing plasma cholesterol of the two groups such that mean values were identical at the end of week 3. Addition of bran had a significant effect in reduced levels of both groups particularly those subjects on the high-cholesterol diet. Subjects on the low- cholesterol diet appeared to have reached a plateau value after three weeks but bran further reduced the level at the end of week 5. When both groups were allowed to return to their previous unspecified dietary regimen at the end of week 5, those with an initially high cholesterol level had returned towards their original level by week 12, while, those with an initially low plasma cholesterol remained at this level. We conclude that wheat fibre is useful in reducing elevated plasma cholesterol levels in a relatively short time on both low and high cholesterol diets.

FARRELL, D.J., GIRLE, L. and ARTHUR, J. (1978). Proc. Nutr. Soc. Aust. 2 : 92

*Department of Biochemistry & Nutrition, University of New England, Armidale, N.S.W. 2351.