Differences in health, knowledge and attitudes between vegetarians and meat eaters in a random population sample

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Keywords: vegetarians; knowledge; attitudes

There is increasing evidence to support the link between better diet and health[1]. The rationale behind most attempts to improve the nation's diet in the 1970s was based on a supposed relationship between knowledge of the principles of nutrition and subsequent food choice. It was hoped that if the population was better informed, they were more likely to adopt healthier life styles. The Department of Health's booklet *Eating for Health*[2], urged changes in dietary patterns in an attempt to improve health but did not specify dietary goals or guidelines. This was followed by a report from the National Advisory Committee on Nutrition Education (NACNE)[3], which made more practical, quantitative recommendations for dietary improvements. However, while the general public became more aware of the relationship between diet and health, many people simply became confused by the differing messages emanating from interested parties[4]. In view of the fact that the budget of the Health Education Council is dwarfed by the amount spent on advertising by the food industry, campaigns aimed simply at improving the dietary knowledge of the population will probably have limited success.

The vegetarian diet embraces many features of the recommended healthier diets, e.g. more fibre and less saturated fat. Cooper *et al.*[5] asked a group of 20 well educated, native-born American vegetarians why they chose to become vegetarian. Thirteen mentioned health concerns. By comparing vegetarians with 'normal' eaters in a randomly selected population, it should be possible to identify some of the factors which influence healthier diet changes, and to incorporate these into health education programmes.

Methods

During February and March 1986 the Cardiff Health Survey was performed to investigate health attitudes, knowledge, practices and beliefs. A systematic random sample, 2.5% of the 1986 draft Parliamentary electorial register for the 4 constituencies of Cardiff, was used. There were 6033 individuals in the final sample, of whom 4266 responded giving a response rate of 71%. A fuller description of the sample and methodology is available elsewhere[6].

Questionnaires were distributed and collected by 150 medical students as part of the Community Medicine course. Of 5145 subjects approached, 4266 (83%) agreed to respond to a self-completion questionnaire. The other 879 subjects were not approached for a number of reasons.

Of the 4266 subjects in the original sample approached, 3129 (73%) agreed to participate. Where a selected individual refused to participate or was unavailable on two separate occasions, a name five lines below on the electoral register was substituted. Further substitutions were performed as required. In total 6033 individuals were approached. Thus, the overall response rate was 71% (4266 questionnaires from 6033 subjects).

It has been shown that neither the 3129 who responded from the original sample, nor the 1137 substitutes are materially different in terms of age, sex and social class to the 1981 census results.

Specific questions were asked about subjects' dietary, alcohol and smoking habits. The health knowledge, attitudes and perceptions of respondents was assessed by their strength of agreement/disagreement with a series of statements.

The magnitude of the difference in response of vegetarians compared with those on a normal diet was quantified with chi-square test.

Results

Respondents to the survey were asked 'What do you usually eat?': 3871 (91%) said that they eat 'a wide range of foods including meat', 90 (2%±0.4%, 95% confidence) 'vegetarian food', 116 (3%) their 'own slimming diet', 26 (1%) 'a slimming diet suggested by a doctor', 96 (2%) 'a diabetic or other "medical" diet' and 40 (1%) replied 'none of the above'. The remainder of the results is a report of differences between the 'normal foods' and 'vegetarian' groups.

Of those individuals reporting to 'usually eat vegetarian food', 68% were female and 44% were single, compared with 52% and 23% respectively of those eating 'normal' diet. The median age of the vegetarians in the sample was only 32 years while that for those on a normal diet was 42 years. Forty per cent of the vegetarian sample were in social classes I and II compared with only 29% of the normal group. Similarly, 30% of vegetarians had been to university compared with only 9% of those eating 'a wide range of foods'.

A number of questions enquired about lifestyle. Forty-three per cent of vegetarians in the survey had never smoked compared to 36% of those on a normal diet. Of those who had smoked, a greater proportion of vegetarians had given up or continued to do so less frequently than their normal diet counterparts. There were also relatively more non-drinkers among the vegetarians (28% compared with 11% of non-vegetarians). However, those vegetarians who did drink tended to do so more often than those on a 'wide range of foods'. This pattern of consumption was not found to be related to age or marital status.

0141-0768/89/010018-03$02.00/0

Table 1. Level of agreement with a sample of statements

		Agree *n* (e)	*Not sure* *n* (e)	*Disagree* *n* (e)	x^2
Health is almost all a matter of luck	Normal	696(693)	511(505)	2548(2557)	5.0
	Vegetarian	13(16)	6(12)	70(61)	
There is too much fuss made about the dangers of smoking	Normal	768(765)	301(297)	2668(2675)	3.6
	Vegetarian	15(18)	3(7)	70(63)	
Adults' health is not affected by breathing in other peoples' tobacco smoke	Normal	457(453)	750(744)	2548(2557)	4.9
	Vegetarian	7(11)	12(18)	70(61)	
As far as alcohol is concerned only spirits do you real harm	Normal	344(342)	693(688)	2724(2731)	2.9
	Vegetarian	6(8)	11(16)	71(64)	
It doesn't do you any harm so long as you don't drink more than 3 pints a day	Normal	1047(1038)	1110(1108)	1600(1611)	6.9
	Vegetarian	15(24)	24(26)	49(38)	
Better food labels would influence what food I buy	Normal	2816(2829)	494(491)	451(441)	13.6
	Vegetarian	80(67)	9(12)	(10)	
Bread contains a lot of fibre	Normal	2479(2488)	879(875)	359(354)	5.4
	Vegetarian	68(59)	17(21)	3(8)	
Polyunsaturated fat is the sort of fat that is bad for your heart	Normal	486(486)	1534(1518)	1679(1695)	13.8
	Vegetarian	12(12)	20(36)	56(40)	
Vegetable fat is rich in cholesterol	Normal	393(394)	1542(1529)	1740(1752)	8.3
	Vegetarian	11(10)	24(37)	54(42)	
Meat and fish contain a lot of fibre	Normal	831(822)	1305(1301)	1541(1555)	10.5
	Vegetarian	10(19)	26(30)	50(36)	

There were 3871 'normal eaters' and 90 'vegetarians' in the sample.
Non-responders deleted for each question.
n, observed number; e, expected number)

Only slightly more of the vegetarian group reported taking more exercise compared with a year ago. Despite tending to have healthier lifestyles vegetarians did not rate their physical condition for their age significantly higher than the general population.

When asked if they thought 'health is almost all a matter of luck' vegetarians gave a score indicating that they disagreed more strongly than the normal group (Table 1). A consistent pattern of response was also found to the statement 'How healthy you are mostly depends on how you look after yourself': 44% of vegetarians stated 'strongly agree' compared to 30% of the normal group, however, only 2% and 4% respectively disagreed with this statement.

Statements relating to attitudes to smoking and alcohol confirmed that vegetarians tended to oppose these habits more than the control group (Table 1). Vegetarians held stronger opinions about each of the statements relating to diet (Table 1), and demonstrated a greater understanding of nutritional concepts than those on a normal diet.

Discussion

Vegetarianism and 'health foods' are becoming increasingly popular in our society as evidenced by the increasing number of shops and restaurants selling such produce. If health educators can discover what causes individuals to make such an important decision as to exclude meat from their diet, perhaps the lessons learnt could persuade society as a whole to change its lifestyle nearer to the proposed 'ideal'.

The results reported suggest that individuals who practice vegetarianism are more aware of the factors influencing better diet and have a healthier lifestyle generally. Differences in social class and education standards are likely to be important factors influencing the difference in nutritional knowledge, but these factors alone only explain a small part of the spectrum of choices that are made.

Freeland-Graves *et al.*[7] administered a questionnaire to 150 vegetarians and a similar number of age and sex matched non-vegetarians. This American study found a similar demographic and social profile to the 90 vegetarians discovered as part of the population-based Cardiff Health Survey, although the American group had a lower percentage who had had higher education.

Freeland-Graves *et al.*[8] also explored health practices, attitudes and beliefs in the two groupings. It was found that the vegetarian group were less likely to drink or smoke, and those who did so, had a lower frequency of consumption. Thus, it would seem that vegetarians are consistent in wanting to adopt other aspects of a healthy lifestyle. Vegetarians and non-vegetarians rated themselves as generally healthy in both the American and this current study. However, Freeland-Graves reported that vegetarians strongly believe that they are healthier than non-vegetarians.

The vegetarians in the sample demonstrated a greater nutritional knowledge and a desire for better information so that they might implement it. The vegetarians were more definite in their response with consistently fewer answering 'not sure' for each of the statements than would be expected. Similarly the observed number of incorrect responses among the vegetarian group was less than the expected number. However, the vegetarians also tended to believe that

health was not 'a matter of luck', but rather that individuals could influence their own fate. This is an important psychological step because although individuals may be able to repeat all the recommendations of health educators, if they do not believe a lifestyle change could help them they are unlikely to adopt that change. This apathetic response has been noted following anti-smoking campaigns. For example, 70% of smokers accept that they risk harming their health by smoking and yet they continue to smoke because only a small proportion of those who accept any health risk realize that they could avoid it by stopping smoking[9].

While very little published data have measured the health knowledge of vegetarians, there have been a large number of studies examining knowledge versus purchasing/dietary habits of housewives or teenagers. A review[10] found that a number of studies have shown nutritional knowledge to be positively correlated with better diets, while others have demonstrated that a change in knowledge level does not necessarily lead to a change in behaviour.

Schwartz[11]found significant correlations between nutritional knowledge and attitudes and between nutritional attitudes and practices. However, the correlation between nutritional knowledge and practices was not significant. Bell[12] measured the effect of nutritional education in modifying dietary behaviour compared with a control group. While the test group significantly improved their knowledge, the change in dietary habits was not dramatic. However, as Sims[13] found, a 'nutrition is important' attitude was one of the most significant predictors of nutritional knowledge.

Another study on the Cardiff Health Survey data[6], showed that individuals of all diet groups who have altered to a healthier diet over the last year, e.g. by eating more fibre or less sugary foods, also demonstrated a greater health knowledge by their responses to the list of statements. It was also shown that individuals who were considering changing their diet have better health knowledge than those who are not. Analysis of the Health Survey data indicates that the health knowledge of the population as a whole is generally good, even amongst those groups who are on 'poor' diets or have made 'unhealthy' changes.

It is unlikely that eating practices will change just because an individual is better informed. However, it is also probably true to say that the better informed are more able to make wiser choices. Thus, while improving the health knowledge of the population is an important factor in altering diet patterns, it cannot by itself achieve this aim.

What seems to be more important is that individuals feel able to control their own destiny and, therefore, healthier changes in lifestyle can result in better health. The fact that the diet adopted by vegetarians is associated with healthier smoking and drinking habits as well as better health knowledge, may indicate that it is more productive to persuade a person to alter their whole lifestyle as a coherent package, rather than by conducting a series of isolated health education campaigns.

Acknowledgments: This survey was funded in part by a grant from The Welsh Scheme for the Development of Health and Social Research and the Welsh Office (Operational Research). Debbie Lambert and Jackie Coombes were Research Officers for the survey.

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