

## Development of food-based dietary guidelines: a case-study of fibre intake in Irish women

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### Food-based dietary guidelines: Fibre intake: Ireland

The recent FAO/WHO report on guidelines for the preparation of food-based dietary guidelines (FBDG) identifies two key principles that should apply (FAO/WHO, 1998). The first is that dietary guidelines should be based on an existing public health problem rather than a difference between prevailing nutrient intake and some recommended ideal nutrient intake. The second key principle identified was that FBDG should be developed in a cultural context, which, among other things, implies that FBDG be derived from prevailing patterns of food intake rather than some epidemiologically based ideal. Within these guiding principles, the translation of nutrient recommendations into FBDG should be flexible to accommodate different levels of knowledge of prevailing food and nutrient intakes of the target group.

Among the options for developing FBDG is that of identifying the major dietary sources of a nutrient. However, that alone will provide useful but limited information and will be only the starting point for developing FBDG strategies. The purpose of this paper is to illustrate the possible options in this area using data on fibre intake of Irish females aged 40–60 years derived from the Irish Nutrition and Dietetic Institutes (INDI) National Nutrition Survey. Table 1 lists the contribution of eight food categories to fibre intake of 40–60-year-old subjects. The objective of the exercise is to explore options for increasing fibre intake from its present level of 16.5 g/d.

Four options are explored. The first looks at % consumers and asks whether it might be possible to get more women to eat a particular food category. The second and third focus on consumers of different foods and ask respectively whether the frequency of intake can be increased and whether serving size can be increased. The final strategy explores whether, within a given food category, nutrient intake can be increased by switching to a comparable alternative.

Table 2 focusses on six sources of dietary fibre and expresses intakes of these foods in g/d for the total population, servings per day or week among consumers only and % consumers. Taking the options of the preceding paragraph, the following becomes evident: whereas it would be possible

to increase the percentage of consumers of breakfast cereals and pulses, it would not really be possible to do so for the remaining foods. Again, whereas it would be possible to increase the frequency of consumption of pulses and fruit, it is either doubtful or not possible to do so for other food categories. In terms of increasing serving size, this seems possible only for pulses. Finally, for both bread and breakfast cereals, comparable higher-fibre alternatives do exist and could be considered.

Tables 3 to 6 consider these strategies for bread, breakfast cereals, pulses and fruit. In each case, the prevailing pattern is compared for its impact on fibre intake with three levels of possible change: modest, quite significant and substantial. In the case of bread, the ratio of the intakes of white to wholemeal is about 80:20. The three levels of change explored are to alter that ratio from 80:20 to 60:40, 40:60 and 20:80. The impact on fibre intake would be to effect increases of 1.3 g/d, 2.5 g/d and 3.6 g/d across the three levels of change. Table 4 examines two options for breakfast cereals. One is to increase the percentage of consumers from 38% to 50%, 70% and 80% at existing fibre concentrations in the breakfast cereal component of the diets of 40–60-year-old Irish women (2.25 g/100 g). The second explores how increasing the fibre density of breakfast cereals, by switching to higher-fibre cereals (10 g/100 g), would influence fibre intake. The incremental change in fibre intake through increasing the percentage of consumers with present levels of fibre density in breakfast cereals is quite small (0.2, 0.1 and 0.3 g/d for level 1, 2 and 3 changes). This increases to 1.0, 0.5 and 1.3 g/d with the higher-fibre type of cereal. Table 5 examines the impact of increasing pulse intake from 1 serving per week to 2, 3 and 4 per week. The increases in fibre intake are 1.8 g/d for each level of change. Table 6 examines how increasing the frequency of fruit consumption from 1 serving per day to 2, 3 and 4 servings per day will influence fibre intake. The impact is of the order of 1.8 g/d for each level of change.

Table 7 summarizes these effects and demonstrates that a level 1 change (modest) increases fibre intake from 16.5 g/d

**Table 1.** Fibre intake (g/d) and % contribution to fibre intake in 40–60-year-old Irish subjects

	% contribution		Fibre intake (g/d)	
	Males	Females	Males	Females
Bread	38	33	7.4	5.5
Breakfast cereals	7	9	1.4	1.5
Biscuits/cakes	7	8	1.4	1.3
Pulses	9	9	1.8	1.5
Vegetables	14	17	2.7	2.8
Potatoes	16	11	3.1	1.8
Snacks	1	2	0.2	0.3
Fruit	9	11	1.8	1.8
Total			19.8	16.5

**Table 2.** Intakes (g/d and servings per day and week) and % consumers of food categories, which might be considered for increasing fibre intake in Irish women aged 40–60 years

	% Consumers	Intake g/d*	Servings*
Bread	98	125	4–5 slices/d
Breakfast cereals	38	66	1 large serving/d
Pulses	77	26	1 average serving/wk
Vegetables	100	105	2 average serving/d
Potatoes	90	140	1 average serving/d
Fruit	88	123	1 average serving/d

\* Consumers only.

**Table 3.** The impact of changing the ratio of white to wholemeal bread on fibre intake in Irish women aged 40–60 years

	Possible changes			
	Present	1st level	2nd level	3rd level
White bread (%)	81	60	40	20
Wholemeal bread (%)	19	40	60	80
Fibre intake (g/d)	16.5	17.8	19.0	20.1

**Table 4.** The effect of increasing the % consumers of breakfast cereals and of switching to higher-fibre cereals on fibre intake in Irish women aged 40–60

	Possible changes			
	Present	1st level	2nd level	3rd level
% consumers	38	50	70	90
* Fibre intake (g/d)	16.5	16.7	16.8	17.1
** Fibre intake (g/d)	16.5	17.5	18.0	19.3

\* Present 2.25 g fibre per 100 g breakfast cereal

\*\* Possible 10.0 g fibre per 100 g breakfast cereal

to 22.2 g/d. The next two levels of change increase this further to 27.5 and 33.5 g/d. Based on this analysis, it becomes evident that we cannot hope to increase fibre intake via potatoes but that we can do so by promoting

**Table 5.** The effect of increasing the frequency of consumption of pulses on the fibre intake of Irish women aged 40–60 years

	Possible changes			
	Present	1st level	2nd level	3rd level
Pulses (servings per week)	1	2	3	4
Fibre (g/d)	16.5	18.3	20.1	21.9

**Table 6.** The effect of increasing the frequency of fruit consumption on fibre intake in Irish women aged 40–60 years

	Possible changes			
	Present	1st level	2nd level	3rd level
Fruit (servings per day)	1	2	3	4
Fibre (g/d)	16.5	18.3	20.1	21.9

**Table 7.** The combined effects of the strategies of Tables 3–6 on fibre intake in Irish women aged 40–60 years

	Possible increase in fibre intake (g/d)		
	1st level	2nd level	3rd level
Via wholemeal bread	1.3	2.5	3.6
Via more cereal users	0.8	1.3	2.6
Via more frequent pulse intake	1.8	3.6	5.4
Via increased fruit intake	1.8	3.6	5.4
Total	5.7	11.0	17.0
New fibre intake	22.3	27.5	33.5

wholemeal bread over white and higher-fibre breakfast cereals over low-fibre cereals and by increasing the frequency of intake of fruit each day and pulses each week. Were this to be the basis of FBDG to increase fibre intake among Irish women, the next phase would be to carry out some focus-group attitudinal research to determine which strategy would be most popular and what level of change would be anticipated within each strategy.

Clearly, this approach can be separately applied to each nutrient and micronutrient and through some appropriate modelling be applied to the diet as a whole. As an exercise, it is useful to illustrate how FBDG can be developed based on prevailing food habits. Used in conjunction with other strategies, such as food patterns at lower and higher quartiles/tertiles of fibre intake, we are more likely to arrive at attainable and culturally acceptable advice on food intake.

## Reference

FAO/WHO (1998) *Preparation of food based dietary guidelines*. Geneva: WHO