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## The diets of middle-aged Glasgow housewives and their adult daughters

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In an earlier paper (Durnin, Blake & Brockway, 1957) the intake and expenditure of energy of two groups of women are discussed. This paper gives further information about their diets.

### EXPERIMENTAL

The food intake of twelve middle-aged, middle-class Glasgow housewives and their twelve adult daughters was measured daily for 1 week by the individual inventory method. Details of the subjects and of the method of the investigation are given in the earlier paper (Durnin *et al.* 1957).

### RESULTS AND DISCUSSION

#### *Pattern of the meals*

The pattern of eating was typical for Scotland: breakfast, dinner in the middle of the day and high tea in the evening; the last two were main meals and included a dish of cooked foods rich in protein. Snacks were often taken at mid-morning, in the after-

noon or before bedtime. There was a marked similarity in the eating habits of both mothers and daughters, especially at the main meals. At breakfast, however, there were slight differences in the type of food eaten. Only one woman (a daughter) regularly took both cereal and a cooked dish rich in protein. About half the mothers, but only two daughters, regularly ate cereal, and four daughters and two mothers ate a cooked 'dish'. The meal pattern on Sundays tended to differ from the usual weekday routine, although there was no consistent variation throughout either group. The housewives ate surprisingly little between meals, and there was almost no 'tasting' while cooking or baking.

#### *Intake of calories and nutrients*

Tables 1-3 give the main sources in the diets of calories, protein, calcium, iron, vitamin A, thiamine, riboflavin, nicotinic acid, ascorbic acid and vitamin D.

*Calories and protein.* The sources of calories were similar for mothers and daughters except that the housewives ate more bread, almost twice as much butter, but just half the quantity of potatoes. More than one-third of the intake of energy was derived from cereal products. (Margarine was used only for cooking except by two daughters.)

The percentage of the total caloric value of the diet contributed by protein was 12.6 for the mothers and 12.3 for the daughters. Both groups obtained about 60% of their protein intake from animal sources, although little cheese was eaten and each subject drank on the average less than  $\frac{1}{2}$  pt. (300 ml.) milk daily. About 40% of the calorie intake was from fat and the remaining 47-48% from carbohydrate.

*Calcium.* The daily mean intake was 0.71 g by the mothers and 0.67 g by the daughters. About one-third of it came from milk and almost another third from bread, cakes, biscuits and buns. By accepted standards, the calcium intake of both groups was somewhat low; seven of the housewives and six of the daughters took two-thirds, or less, of the B.M.A. standard (British Medical Association: Committee on Nutrition, 1950). The main reason was undoubtedly the small quantity of milk and cheese consumed.

*Iron.* The daily mean intake was 12 mg by the mothers and 13 mg by the daughters. Of it, about one-third came from meat and about one-quarter from bread, cakes, biscuits and buns. Four mothers and two daughters had four-fifths, or less, of the recommended (B.M.A.) allowance of 12 mg iron daily.

*Vitamin A.* All the housewives received the recommended allowance of this vitamin. The mean intake of the daughters also reached this standard, although three of them had four-fifths, or less, of it. The main sources were soups, root vegetables and butter. Liver was seldom eaten.

*Thiamine.* The intake was adequate according to the B.M.A. standards.

*Riboflavin.* The mean consumption was similar in both groups but was less than the 1.3 mg daily advised by the B.M.A. Indeed six housewives and nine daughters took three-quarters, or less, of this amount. Again, the lack of milk in the diets was probably the main reason.

*Nicotinic acid.* This vitamin was taken in sufficient amount, by B.M.A. standards, by virtually all the subjects.

Table 1. *Principal sources of energy and protein in the average daily diets of middle-aged housewives and their adult daughters*

Source	Energy				Protein			
	Housewives		Daughters		Housewives		Daughters	
	Cal./head/ day	Percentage of total	Cal./head/ day	Percentage of total	g/head/ day	Percentage of total	g/head/ day	Percentage of total
Bread	303	14.4	257	11.6	9.4	14.2	8.0	11.5
Cakes, biscuits, buns	442	21.1	451	20.3	8.5	12.8	8.0	11.5
All meat	297	14.2	335	15.0	21.1	31.8	25.2	36.2
Fish					4.9	7.4	5.9	8.5
Milk					6.5	9.8	7.0	10.1
Eggs					3.7	5.6	3.7	5.3
Cheese	202	9.7	188	8.5	2.1	3.2	0.7	1.0
All puddings and cereals					2.9	4.4	3.2	4.7
Sugar, preserves	154	7.3	177	8.1	—	—	—	—
Sweets, chocolates	114	5.4	139	6.2	—	—	—	—
Potatoes	132	6.3	268	12.1	2.6	3.9	4.0	5.8
Butter	266	12.7	162	7.3	—	—	—	—
Other foods	112	5.2	137	6.1	4.5	6.9	3.8	5.4
Total	2100	100.0	2220	100.0	66.2	100.0	69.5	100.0
Range	1600-2400		1800-2700		48-83		56-82	

Table 2. *Principal sources of calcium and iron in the average daily diets of middle-aged housewives and their adult daughters*

Source	Calcium*				Iron*			
	Housewives		Daughters		Housewives		Daughters	
	mg/head/ day	Percentage of total	mg/head/ day	Percentage of total	mg/head/ day	Percentage of total	mg/head/ day	Percentage of total
Bread	107	14.9	91	13.6	1.2	10.0	1.1	8.5
Cakes, biscuits, buns	89	12.4	84	12.6	1.9	15.8	1.8	13.8
All meat	43	5.9	48	7.1	4.7	39.2	5.2	40.0
Fish								
Eggs								
Cheese	69	9.7	23	3.4	—	—	—	—
Milk, milk puddings	298	41.8	322	48.3	—	—	—	—
Soups	—	—	—	—	0.8	6.7	0.6	4.6
Root vegetables†	48	6.7	43	6.4	—	—	—	—
All vegetables	—	—	—	—	0.8	6.6	1.1	8.5
Sweets, chocolates‡	—	—	—	—	0.5	4.2	0.6	4.6
Other foods	60	8.6	57	8.6	2.1	17.5	2.6	20.0
Total	714	100.0	668	100.0	12.0	100.0	13.0	100.0
Range	425-1005		470-850		9.5-17.0		8.0-17.5	

\* B.M.A. recommended allowance for calcium 800 mg/day, for iron 12 mg/day (British Medical Association: Committee on Nutrition, 1950).

† Included under all vegetables in table for iron.

‡ Included under other foods in table for calcium.

Table 3. Principal sources of vitamin A, thiamine, riboflavin, nicotinic acid, ascorbic acid and vitamin D in the average daily diets of middle-aged housewives and their adult daughters

Source	Vitamin A*				Thiamine*				Riboflavin*			
	Housewives		Daughters		Housewives		Daughters		Housewives		Daughters	
	i.u./head/day	Percentage of total	i.u./head/day	Percentage of total	mg/head/day	Percentage of total	mg/head/day	Percentage of total	mg/head/day	Percentage of total	mg/head/day	Percentage of total
Soups	874	21.4	795	27.6	0.12	13.8	0.09	10.1	0.06	5.4	0.04	4.1
All meat	605	14.9	—	—	0.10	18.4	0.18	20.2	0.22	19.4	0.18	16.8
Liver†	144	3.5	156	5.4	0.14	16.0	0.15	16.8	0.30	28.4	0.34	31.7
Milk	300	7.3	300	10.4	—	—	—	—	0.13	12.1	0.13	12.5
Eggs	111	2.7	87	3.0	—	—	—	—	0.04	3.9	0.01	1.3
Cheese	1105	27.0	680	23.6	—	—	—	—	—	—	—	—
Butter	—	—	—	—	0.11	12.6	0.10	11.2	—	—	—	—
Cakes, biscuits, buns	—	—	—	—	0.15	17.2	0.13	14.6	—	—	—	—
Bread	—	—	—	—	0.04	4.6	0.04	4.5	—	—	—	—
Puddings, cereals	42	1.0	30	1.1	0.07	8.0	—	—	—	—	—	—
Green vegetables	630	15.4	507	19.8	—	—	—	—	—	—	—	—
Root vegetables	—	—	—	—	0.08	9.4	0.09	10.2	—	—	—	—
Potatoes	280	6.8	313	10.8	0.87	100.0	0.89	100.0	0.15	13.3	0.18	16.8
Canned vegetables‡	—	—	—	—	0.72-1.12	—	0.72-1.12	—	0.89-1.47	—	0.79-1.13	—
Fruit and fruit juices§	—	—	—	—	—	—	—	—	—	—	—	—
Other foods	4991	100.0	2878	100.0	—	—	—	—	—	—	—	—
Total	2426-6113	—	1695-4604	—	—	—	—	—	—	—	—	—
Range	—	—	—	—	—	—	—	—	—	—	—	—

  

Source	Nicotinic acid*				Ascorbic acid*				Vitamin D			
	Housewives		Daughters		Housewives		Daughters		Housewives		Daughters	
	mg/head/day	Percentage of total	mg/head/day	Percentage of total	mg/head/day	Percentage of total	mg/head/day	Percentage of total	i.u./head/day	Percentage of total	i.u./head/day	Percentage of total
Soups	0.86	10.1	0.60	6.4	7.8	21.5	5.8	16.2	—	—	—	—
All meat	3.50	40.9	4.50	47.9	—	—	—	—	—	—	—	—
Liver†	—	—	—	—	—	—	—	—	—	—	—	—
Milk	—	—	—	—	—	—	—	—	—	—	—	—
Eggs	—	—	—	—	—	—	—	—	—	—	—	—
Cheese	—	—	—	—	—	—	—	—	—	—	—	—
Butter	—	—	—	—	—	—	—	—	—	—	—	—
Cakes, biscuits, buns	—	—	—	—	—	—	—	—	—	—	—	—
Bread	1.31	15.3	1.10	11.7	—	—	—	—	—	—	—	—
Puddings, cereals	0.78	9.2	0.80	8.5	—	—	—	—	—	—	—	—
Green vegetables	—	—	—	—	2.5	6.9	3.0	8.4	—	—	—	—
Root vegetables	—	—	—	—	3.3	8.8	3.2	8.9	—	—	—	—
Potatoes	0.66	7.7	1.00	10.6	—	—	—	—	—	—	—	—
Canned vegetables‡	—	—	—	—	2.8	7.7	1.2	3.4	—	—	—	—
Fruit and fruit juices§	—	—	—	—	14.5	39.9	15.3	42.8	—	—	—	—
Other foods	1.44	16.8	1.40	14.9	2.2	6.1	2.3	6.3	2	2.0	1	1.5
Total	8.55	100.0	9.40	100.0	36.3	100.0	35.8	100.0	93	100.0	81	100.0
Range	5.9-10.5	—	7.3-11.6	—	10.3-127.5	—	17.1-71.1	—	42-114	—	49-144	—

For root and green vegetables it was assumed that 50% and 75% respectively of the original vitamin C was lost in cooking. To cover similar losses of thiamine, 15% was deducted. In calculating the vitamin A content of the diets, the weight of carotene in each food was divided by 3 and then recorded as vitamin A.

\* B.M.A. recommended allowance for vitamin A, 2500 i.u./day, for thiamine 0.4 mg/1000 Cal., for riboflavin 1.3 mg/day, for nicotinic acid 8 mg/day, for ascorbic acid 20-30 mg/day.

† Included under all meat for all vitamins except vitamin A.

‡ Included under green and root vegetables or other foods for all vitamins except ascorbic acid.

§ Included under other foods for all vitamins except ascorbic acid.

*Ascorbic acid.* Seven mothers and seven daughters received less than 30 mg ascorbic acid daily from their food; one mother received only 10 mg. About 40% of the intake was provided for both groups by fruit and fruit juice.

*Vitamin D.* The mean daily intake of the mothers was 93 i.u. and that of the daughters 81 i.u. It was chiefly from butter.

Our results are very similar to those of Widdowson & McCance (1936) in a survey on some women in England. The intake of protein is almost identical, that of calcium and of iron is very slightly higher in the present study.

#### SUMMARY

1. The food intake of a group of twelve middle-aged, middle-class Glasgow housewives and their twelve adult daughters was measured individually throughout 7 consecutive days.
2. Details of the various constituents of the diets are given and the adequacy of the diets is discussed.
3. Most of the essential nutrients were taken in what is believed to be sufficient quantity, but several mothers and daughters had low intakes of calcium, iron, riboflavin and ascorbic acid.

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