

Staple food intake in a rural village in Verata, Fiji

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Abstract

An assessment of food intake and body composition in twenty women in a relatively isolated rural village in Fiji was made. Subcutaneous fat distribution was assessed by the measurement of subscapular and triceps skin folds. Compared with measurements made on Polynesian and European women in New Zealand it was found that the Fiji women had relatively more central subcutaneous fat than Polynesian or European. Diet was assessed by two 7 day periods of diet diaries and analysed by food type. The two main foods eaten were cassava and flour based goods.

Introduction

Diet is fundamental to good health but very difficult to measure. Treatment of ill-health related to diet and metabolism e.g. obesity, undernutrition and diabetes mellitus requires basic research into diet both past and present. The aim of a larger project than the findings reported here was to determine how well what people eat over a long

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period of time can be determined from stable isotope ratios of hair, ear-wax, breath and saliva samples. This pilot study of 20 individuals in the district of Verata adds to the body of knowledge that is used in the formulation of strategies for the improvement of health by good nutrition. Collaborative researchers and students were drawn from the University of the South Pacific, National Food and Nutrition Committee, Auckland Institute of Technology and Oxford University.

Method

The study was conducted in the district of Verata in a village 30 km north east of Suva, the capital of Fiji. Several projects on marine resource management had recently taken place in the area so the community involved was sensitive to the needs of scientific investigation. Twenty women volunteered to take part in the study. Height, weight, waist and hip circumference and triceps and subscapular skinfold thickness of the volunteers was measured and the measurements are summarised in Table 1. Two seven day diet diaries were recorded by each woman 17 days apart. Three women weighed their food, the remaining 17 used household measures to estimate

their daily dietary intake. The household measures diets were then translated into amounts based on the serving sizes of those who weighed their food and the recipe composition database *archives* at the Food and Textiles Department at the University of the South Pacific.

Information was extracted from the diaries and listed by type of food and quantity.

The 5% level was chosen for statistical significance. Comparisons between groups were made using one way ANOVA. Analyses were carried out using SigmaStat for Windows Version 2.03 SPSS Inc 1997

Results

Comparison of the anthropometric measurements of the 20 women in this study was conducted with measurements made in similar (age and size) women in New

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Table 1. Subject characteristics. Fijian. n=20

Measurement	mean \pm SD	range
Age y	35.2 \pm 12.2	19 - 65
Height cm	166.4 \pm 6.6	149.6-179.2
Weight kg	74.7 \pm 9.9	57.2 -89.9
BMI kg.m ²	27.0 \pm 3.6	20.5 - 32.9
Waist cm	87.1 \pm 10.2	68.3 - 103.5
Hip cm	105.5 \pm 6.5	92.4 - 117.4
Waist/Hip ratio	0.82 \pm 0.07	0.73 - 0.96
Subscapular cm	2.60 \pm 0.85	0.94 - 3.77
Triceps cm	1.96 \pm 0.63	0.94 - 3.23
Subscapular/Triceps	1.33 \pm 0.26	0.89 - 1.81

Zealand by the same researcher (ER)^{1,2}, Table 2. Fijian women had a greater waist to hip ratio and more children than the European and Polynesian groups. The subscapular to triceps skinfold ratio of both Polynesian and Fijian women was greater than in European women.

Eighty four different foods were reported as eaten by the women. Table 3 lists in descending order by weight the average daily dietary intake/woman of the 21 most commonly eaten foods. For these foods carbohydrate supplied 64% of the total energy, protein 10% and fat 15%. In the total diet of 84 different foods 66% of the energy was from carbohydrate, 13% protein and 21% fat. For the 84 foods average daily energy intake reported was 8707 kJ.

Discussion

Given the small sample of 20 women there are no definitive conclusions that can be drawn from this data. This is however a unique record of foods consumed in a relatively isolated village. Fourteen days of diet diary by household measures is a credit to the diligence of the volunteers and their co-ordinator. A comparison may be drawn to the 1993 National Nutrition Survey conducted by the National Food and Nutrition Committee, Suva, Fiji³. The common foods most

Table 2. Comparison of anthropometry of women aged 18-27 years and with a BMI \leq 32 kg.m²

Measurement	Fijian women	Polynesian	European	
	n=8	n=25	n=28	
Age y	24.4 \pm 4 (19-27)	24 \pm 2 (18-25)	22 \pm 2 (18-25)	NS
Height cm	168.4 \pm 4.6 (163.2-174.8)	167.6 \pm 6.2 (155.2-178.2)	163.9 \pm 6.5 (153.0-180.2)	NS
Weight kg	75.7 \pm 12.6 (59.5-89.9)	74.2 \pm 10.5 (56.2-96.1)	66.25 \pm 12.86 (48.1-97.01)	NS
BMI kg.m ²	26.65 \pm 3.95 (22.34-32.91)	26.43 \pm 3.61 (19.80-32.22)	24.69 \pm 4.59 (16.45-32.38)	NS
Waist cm	84.0 \pm 9.9 (73.8-99.0)	78.2 \pm 8.3 (66-92.7)	73.7 \pm 10.4 (61.7-94.5)	NS
Hip cm	105.5 \pm 8.3 (97-117.4)	103.7 \pm 7.2 (89.8-117.7)	99.7 \pm 9.9 (85.1-121.9)	NS
Waist/Hip ratio	0.80 \pm 0.05 (0.75-0.88)	0.75 \pm 0.05 (0.70-0.89)	0.74 \pm 0.06 (0.65-0.89)	?
Subscapular cm	2.61 \pm 1.03 (1.33-3.77)	2.41 \pm 0.94 (1.05-4.78)	1.89 \pm 1.07 (0.78-4.70)	NS
Triceps cm	2.10 \pm 0.73 (1.05-3.23)	2.28 \pm 0.61 (1.03-3.48)	2.30 \pm 0.82 (1.03-4.15)	NS
Subscapular/Triceps	1.23 \pm 0.26 (0.89-1.63)	1.05 \pm 0.27 (0.64-1.77)	0.79 \pm 0.23 (0.38-1.33)	?
Children	0.88 \pm 0.99 (0-2)	0.12 \pm 0.44 (0-2)	0.14 \pm 0.59 (0-3)	§

^{*} European significantly different to Polynesian

[?] European significantly different to Fijian

[§] Fijian significantly different to European and Polynesian

Table 3. Average daily dietary intake/woman for the twenty one most commonly eaten foods by weight

Food item	g.day ⁻¹	CHO	Protein	Fat	energy
		g	g	g	%
Cassava	331	106	2	1	22.4
Flour	174	127	19	2	31.3
Breadfruit	91	20	1	1	4.6
Fish	70	0	15	2	4.1
Lolo	59	1	1	10	5.3
Ivi	59	16	2	0	4.0
Sugar	53	53	0	0	11.0
Rourou	50	0	2	0	0.6
Rice	48	13	1	0	3.0
Potato	30	4	1	0	1.0
Bele	26	1	1	0	0.5
Oranges	21	2	0	0	0.4
Coke	19	2	0	0	0.4
Tinifish	17	0	2	2	1.7
Kaikoso	13	0	2	0	0.5
Soyabean oil	13	0	0	13	6.3
Vudj	12	3	0	0	0.6
Tarō	11	3	0	0	0.6
Guava	10	0	0	0	0.1
Yaga	9	2	1	1	1.2
Yam	9	2	0	0	0.4
Butter	4	0	0	3	1.4
Total g	1129	357	50	36	89%

frequently consumed in rural areas reported by indigenous Fijians in the 1993 survey were in descending order, sugar, cassava, coconut oil, lolo, rice, dalō, butter, roti, bread, potato and noodles. In the same report a comparison with surveys of Fijian people in 1981 and 1988 the consumption of cassava was shown to have decreased and rice to have increased. Although these surveys and ours had different methodologies it does show that the changes in diet are "irreversible"⁴. We analysed our diet in terms of the ingredients so bread was reported mainly as flour. The amount of butter consumed is related to the amount of bread consumed. Rice and bread are relatively cheap, little-preparation-needed foods and this would explain their use as the major sources of complex carbohydrate.

Analysis of food and other samples collected continues and will be the subject of further reports.

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