

**Associate Parliamentary Food & Health
Forum
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Validation of nutrient profile models



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Development of FSA model

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3	WXYAP11FVN. nut	Various modifications to WXY regarding how to apply the scores to different foods

Validation of Model SSCg3d

- Agreement with nutrition professionals
- Using Model SSCg3d to assess diets

Agreement with nutrition professionals

- 850 responses from British Dietetic Association and Nutrition Society members to online questionnaire
- Nutrition professionals asked to categorise 40 foods from a master list of 120

Agreement with nutrition professionals

Nutrient Profiles: Professional Perception of the Healthiness of Individual Foods
Foods: 11 - 15

Please classify the following foods as more or less healthy.

→ View Instructions → Hide Nutritional Data

Feta Cheese: Serving Size 40 g

Less Healthy << < < < < > > > > > More Healthy

Energy	Protein	Carbohydrate	Sugars	Fat
250 kcal	15.6 g	1.5 g	1.5 g	20.2 g
Saturated Fat	Fibre	Sodium	Calcium	Iron
13.7 g	0.0 g	1440 mg	360 mg	0.2 mg

Sugar Puffs: Serving Size 30 g

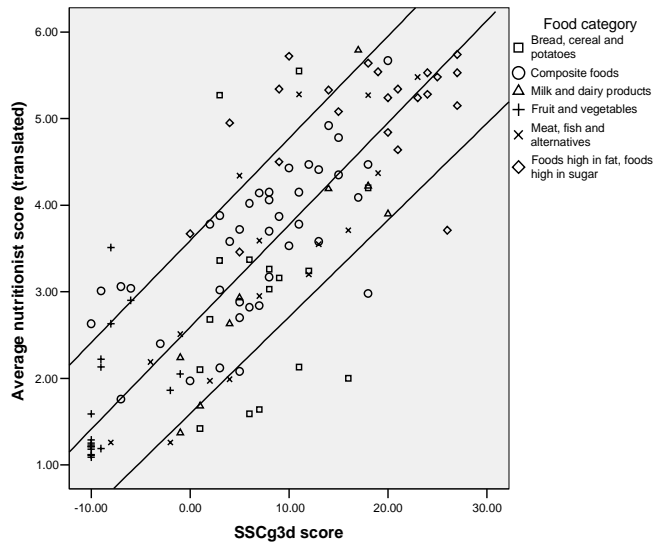
Less Healthy << < < < < > > > > > More Healthy

Energy	Protein	Carbohydrate	Sugars	Fat
381 kcal	6.1 g	92.7 g	51.5 g	1.0 g
Saturated Fat	Fibre	Sodium	Calcium	Iron
0.2 g	3.2 g	9 mg	14 mg	8.0 mg

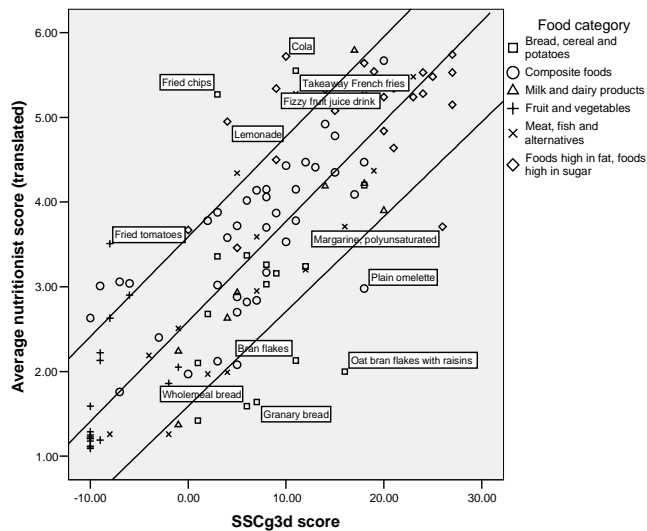
Agreement with nutrition professionals

- Average score calculated for each of 120 foods, ranging between 1 (less healthy) and 6 (more healthy)
- Average standard deviation for foods = 0.95

Average nutritionist score against Model SSCg3d score, with weighted fit line and weighted fit line ± 1



Average nutritionist score against Model SSCg3d score, with weighted fit line and weighted fit line ± 1



Correlation between continuous nutrient profile model scores and average nutritionist score

Model	Spearman's rho (95% CI)
SSCg3d	0.80 (0.73, 0.86)
WXY	0.79 (0.71, 0.85)
NFI(a)	0.70 (0.60, 0.78)
NFI(b)	0.69 (0.58, 0.77)
NFI(c)	0.64 (0.52, 0.73)
RRR	0.74 (0.65, 0.81)
NNR	0.62 (0.50, 0.72)

Correlation between categorical nutrient profile models and quintiles of average nutritionist score

Model	χ^2 score
SSCg3d (healthy threshold)	55.684
WXY (healthy threshold)	57.434
Swedish Green Keyhole scheme	42.669
Australian Heart Foundation's Tick scheme	50.042

Agreement with nutrition professionals

Results of multivariate stepwise regression:

Variable	R ² after initial inclusion	Standardised co-efficient (final model)	Significance (final model)
Energy	0.39	-0.60	p < 0.001
Fruit/vegetable	0.47	0.14	p = 0.047
NSP fibre	0.51	0.18	p = 0.003
Total sugar	0.55	-0.31	p < 0.001
Takeaway	0.59	-0.18	p = 0.001
Fried	0.63	-0.19	p < 0.001
Serving size	0.65	-0.26	p < 0.001
Sodium	0.68	-0.19	p = 0.003
Wholemeal	0.69	0.12	p = 0.028

Agreement with nutrition professionals

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Agreement with nutrition professionals

Conclusions:

Model SSCg3d achieves closer agreement with nutrition professionals than other established models over:

- The ranking of foods, when used as a scoring system
- The categorisation of healthy foods, when used categorically

Agreement with nutrition professionals

Conclusions (cont'd):

- Energy, fruit and vegetables, NSP fibre, total sugars and (to a lesser extent) sodium levels have a large impact on how nutrition professionals categorise foods (accounting for over 55% of nutrition professional variance)

Using Model SSCg3d to assess diets

- Data from the 2000/01 National Diet and Nutrition Survey of adults aged 19-64

Respondents split at the median intake of three key nutrients:

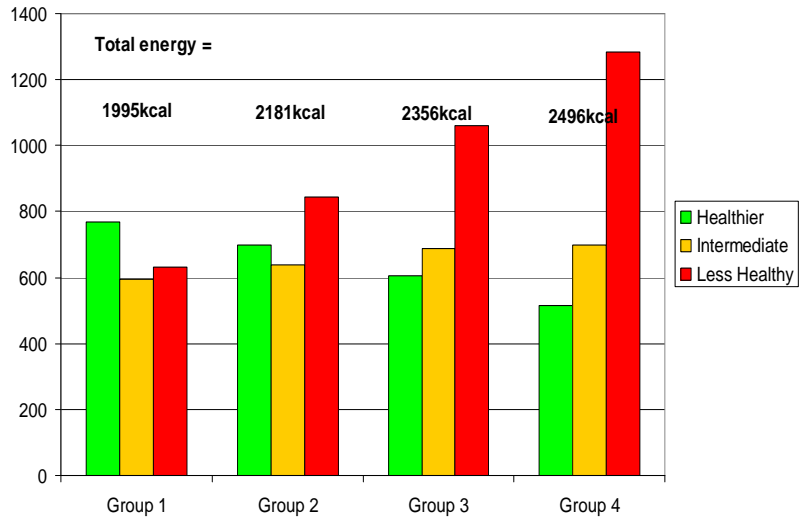
- Saturated fat: <12.5% of total energy
- NMES: <11.2% of total energy
- Salt: <8.3g/day

Using Model SSCg3d to assess diets

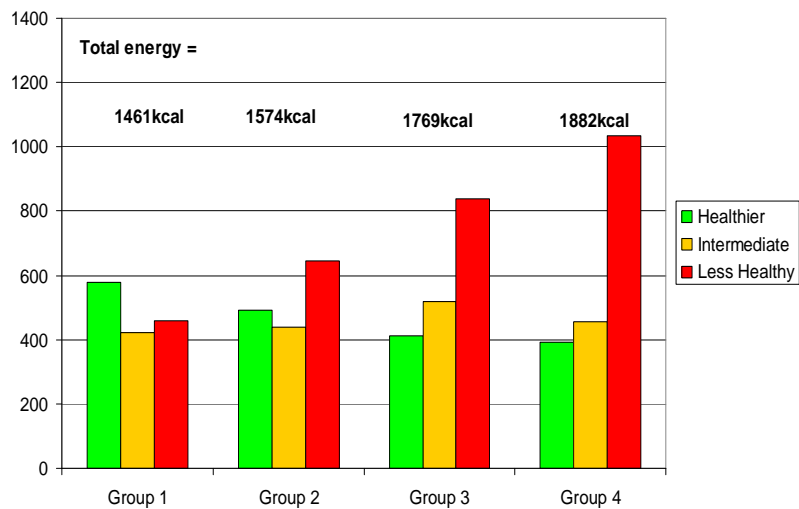
Group	Optimum nutrient levels achieved	n	Males	Females
1 (most healthy)	3	161	46	115
2 (Healthy)	2	543	211	332
3 (Less healthy)	1	488	246	242
4 (Least healthy)	0	183	118	65

N = 1375

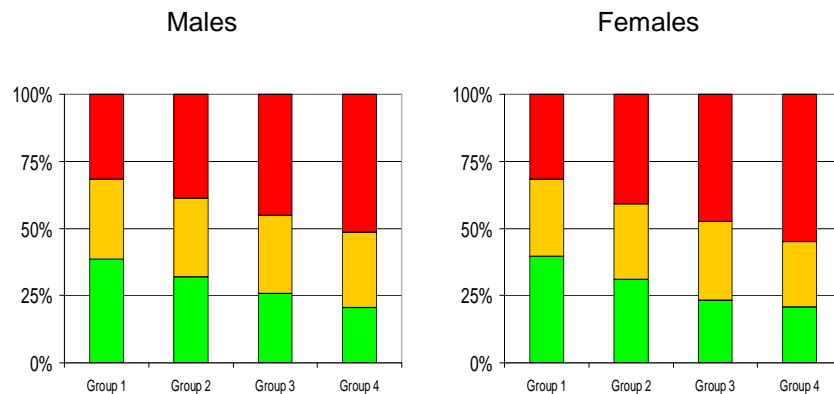
Consumption (kcal/day) of healthier, intermediate and less healthy foods by health group, males



Consumption (kcal/day) of healthier, intermediate and less healthy foods by health group, females



Percentage contribution to diet of healthier, intermediate and less healthy foods, males and females



Using Model SSCg3d to assess diets

- Data from the 2000/01 National Diet and Nutrition Survey of adults aged 19-64

Respondents split by conformity with three population dietary goals:

- Saturated fat: <10% of total energy
- NMES: <10% of total energy
- Sodium: <2.4g/day

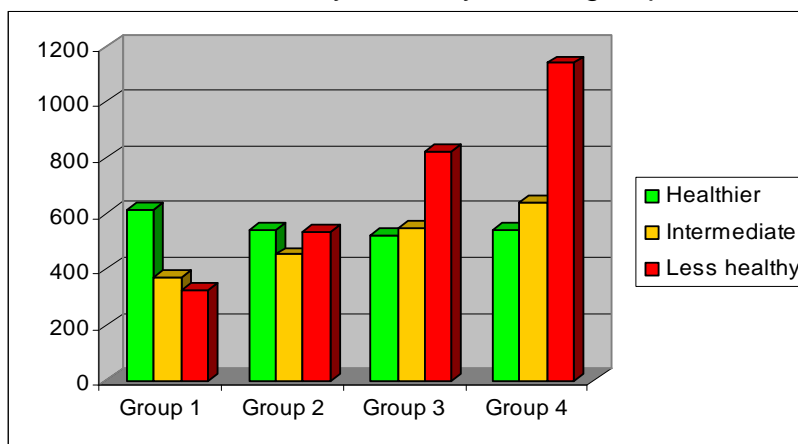
Using Model SSCg3d to assess diets

Group	Population dietary goals achieved	n	Males	Females
1 (most healthy)	3	73	10	63
2 (Healthy)	2	411	103	308
3 (Less healthy)	1	737	338	399
4 (Least healthy)	0	498	311	187

N = 1719

Using Model SSCg3d to assess diets

Consumption (kcal/day) of healthier, intermediate and less healthy foods by health group



Using Model SSCg3d to assess diets

Conclusion

- Achievement of preferred nutrient intake levels (or population dietary goals) is associated with the relative proportion of healthier, intermediate and less healthy foods consumed