THE ROLE OF SITE SPECIFIC HABITS SURVEYS IN RADIOLOGICAL ASSESSMENTS.

by [1]D L Smith, [1]K Winpenny, [2]T Eaton & [2]G P L Naylor.

Introduction

The current 'Top Two' method used by MAFF for the assessment of dose to the public from atmospheric discharges, via consumption of terrestrial foods, utilises,

a) consumption rates derived from national food surveys, and assumes that
b) all terrestrial food in appropriate groups, see Table 1, eaten by members of the critical group is locally produced, unless there is clear evidence to the contrary, and
c) that the two food groups with the greatest dose implications are consumed at the 97.5 percentile rate derived from the national surveys, plus the contribution from the remainder of the diet calculated using derived mean consumption rates.

Table 1. Food Group Key

A	Milk	H	Honey	O	Other vegetables
B	Beef	I	Mushrooms	P	Potatoes
C	Crustaceans	J	Rabbit/Hare	R	Root Vegetables
D	Domestic Fruit	K	Pork	S	Eggs
F	Fish	L	Lamb	W	Wild/Free Foods
G	Green Vegetables	M	Molluscs	Y	Poultry

This study compares the derived consumption rates used by MAFF for the assessment of dose to adults[1], with the results of site specific habits surveys.

The Surveys

Nine surveys were conducted over 3 years (see map). During the surveys individuals within 5km radius from the site centre who may increase their exposure primarily as a result of consuming terrestrial foods, potentially contaminated by atmospheric radioactive discharges from the nuclear establishment, were sought. Those contacted were asked, by way of a questionnaire, to estimate, for themselves and the members of their families, their production and/or consumption of local foods (kg/y). The questionnaire used during the survey was specifically designed to cover all aspects of terrestrial food production, processing, storage and consumption. It included sections on;

- commercial food production by farmers, market gardeners, small holders etc,
- the types and amounts of crops grown and livestock reared (inc. dairy herds), personal local food production and consumption by allotment holders, keen gardeners, beekeepers etc., including fruit, vegetables, livestock, animal produce (eggs, milk products and honey) and wild foods (fruit, game, wildfowl, fungi etc).
- seasonality

Results

Following each survey, all data were converted to annual consumption rates (kg, or l for milk) of locally produced food. The consumption rate data obtained for adults during the survey conducted around one particular site, Springfields, is summarised in Table 2.

Table 2. Adult consumption data at Springfields

No. of food groups consumed above the generic 97.5% rate.	No. of food groups consumed above mean rate.										
5											
4							1				
3						3	4	3	1	3	
2			1	1	6	3	4	6			
1		6	14	10	8	9	9				3
0	104	54	22	13	4						
	0	1	2	3	4	5	6	7	8	9	

The data for Springfields, showed that 15 of the individuals interviewed (5%) were consuming food at above the derived 97.5% rates and that the majority of consumers interviewed (64%) consumed one or more food groups at above the derived mean rates. Similar data were obtained for all the sites surveyed.

The food groups most commonly observed as being consumed at rates above the derived 97.5% rates were green vegetables, potatoes and eggs. Milk, beef, domestic fruit, honey and root vegetables were also eaten at above the 97.5% rates at most sites.

Conclusions and Discussion

The results of this survey indicate that;

i) the majority of people within the survey areas either produce or have access to locally produced foods
ii) that some individuals consumed these foods at high rates.

This is in accordance with the general assumptions made in MAFF assessments.

iii) The mean value for local food contribution to the diet observed during the study as estimated by the high rate consumers, was 36% (range 15%-49%).

This suggests that the assumption that all terrestrial food in appropriate groups eaten by members of the 'critical group' is locally produced is conservative.

iv) The data show that some adults consume more than two food groups at above the generic 97.5% rates, and that further food groups, but not all, are consumed above the generic mean rate.

This information suggests that the current 'Top Two' method may not be adequately conservative with respect to the contribution made by those food groups consumed at the 97.5th rates. However, this may be balanced by the fact that the assumed contribution from the remainder of the diet, calculated using derived mean consumption rates, is greater than observed. Additionally, for MAFF assessments the two food groups assumed to be consumed at the 97.5% rate are the most radiologically important.

References

1. Ministry of Agriculture, Fisheries and Food, 1998. Guidance for assessing the potential impact of radioactivity discharged into the atmosphere. Version 5. MAFF, London.
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[1]The Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Lowestoft Laboratory, Pakefield Road, Lowestoft, Suffolk NR33 0HT, UK
[2]RSND, MAFF, Ergon House, Smith Square, London SW1P 3JR, UK

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