Nutrient Intakes

Last updated: December 2014

This paper describes how nutrient intakes are calculated from food purchases and how they are compared to nutrient recommendations and other dietary guidelines.

Background

The figures in Family Food are sourced from The Living Costs and Food Survey run by the Office for National Statistics. One element of the survey - The Family Food Module collects detailed quantity and expenditure information on household food and drink purchases and itemised lists of food and drink eating out purchases for use by Defra.

The Office for National Statistics has overall project management and financial responsibility for the survey while Defra sponsors the specialist food data.

Table 1: List of terms used

Abbreviation	Description
COMA	Committee on Medical Aspects of Food and Nutrition Policy
DRV	Dietary Reference Values. Department of Health, 'Dietary Reference Values for Food Energy and Nutrients for the United Kingdom', HMSO 1991.
EAR	Estimated Average Requirement
NSP	non-starch polysaccharides
RNI	Reference Nutrient Intakes. Reference Nutrient Intake (RNI) values for protein, vitamins and minerals are set for each age/sex group at a level of intake considered likely to be sufficient to meet the requirements of 97.5% of the group.
SACN	Scientific Advisory Committee on Nutrition. A UK-wide advisory committee set up to replace COMA. It provides advice to UK Health Departments.

Estimation of Nutrient Intakes

Estimated nutrient intakes are calculated from food purchases using nutrient composition data supplied by Public Health England (PHE). The majority of the data is from PHE's nutrient analysis programme, supplemented by values from manufacturers and retailers. Each of the 500 food codes in the Family Food Module is made up of a number of sub-codes with nutrient composition data attached. For example, the food code 'fruit juice' comprises a number of sub-codes including grapefruit, orange, pineapple and apple juices. A weighted average nutrient

composition is calculated for each food code based on estimates of the market share of each sub-code. Nutrient values for the food codes in the eating out component of the survey are generated by mapping each code to an equivalent food code or combination of food codes in the latest version of the nutrient databank for the National Diet and Nutrition Survey.

The nutrient composition data is updated on a rolling basis to keep information in line with new or reformulated products. All nutrient compositions are based on edible food and take into account inedible (unavoidable) waste, e.g. banana skins.

Table 2: Food codes updated by year

Year	Codes updated
2006	Bacon & ham; baked beans; bread; breakfast cereals; burgers; canned pasta; cheese; crisps & savoury snacks; dips; fast foods; fish products; flours & grains; potato products; ready meals; sausages; soups; sauces.
2007	Biscuits; breakfast cereals; crisps & savoury snacks; fast foods; fats; soft drinks.
2008	Biscuits; cakes.
2009	Biscuits; breakfast cereals; chicken burgers; butter; cakes; cereal convenience foods (e.g. quiche, corn snacks, tortilla chips); chips; cooked poultry; confectionery and chocolate; crispbreads; fish and fish products; ice cream; infant foods (rusks); lard; meat pies, pasties and puddings; pizza; sausage rolls; soft drinks; soup; spreads and dressings; vegetable based ready meals; wine (including low-alcohol).
2010	Fish and fish products; eggs; breakfast cereals; cereal snacks; crisps and potato snacks; chocolate bars; cheese; fresh vegetables.
2011	Fish and fish products; eggs; confectionery; bread; sponge puddings; custard; ice cream; soup; pizza; meat pasties and puddings; sausage rolls; breaded chicken and chicken burgers; cereal convenience foods (e.g. quiche, corn snacks, tortilla chips); chips; coleslaw; fats ; milk.
2012	Filled chocolate bars; fresh and baking potatoes; fresh and frozen carrots; fresh and frozen onions; fresh and frozen broccoli; mushrooms; cabbage; fresh and frozen cauliflower; French beans; cherry tomatoes and other tomatoes; lettuce; cucumber; bananas; apples – Cox's, golden delicious, Granny Smith's and red desserts; pears; grapes; fresh and frozen strawberries; tangerines/clementines; oranges; melon – honeydew and galia; frozen peas; canned and bottled tomatoes; tomato puree; canned baked beans; orange juice including unsweetened and frozen; apple juice.
2013	Canned peas; canned butter beans and kidney beans; reduced sugar baked beans; canned chick peas; canned sweetcorn; canned carrots; sliced and unsliced white bread; sliced and unsliced brown bread; fortified and unfortified soft grain bread; granary and wholemeal bread; brown and white bread rolls; French bread and rolls; reduced calorie and Danish bread; pitta bread; garlic bread; naan bread; ciabatta and bagels; high-fibre breakfast cereals; sweetened breakfast cereals; corn

and corn/rice flake breakfast cereals; pizzas; reduced fat cheddar cheese; spreadable butter; soft margarines; reduced fat spreads; hard, baking margarines and fats; lard, suet and compound cooking fats.

Definitions

The Government has set various nutrient recommendations and dietary guidelines, most of which were published by the Committee on Medical Aspects of Food and Nutrition Policy (COMA). Its successor the Scientific Advisory Committee on Nutrition (SACN) has recently published revised dietary reference values for the energy requirements of the population. The analysis in this report is based on the original values published by COMA, to maintain consistency with previous estimates.

Reference Nutrient Intake

Nutrient intakes derived from the survey are compared with Reference Nutrient Intakes. These Reference Nutrient Intakes (RNIs) represent the best estimate of the amount of a nutrient that is enough, or more than enough, for about 97 per cent of people in a group. If average intake of a group is at the level of the RNI, then the risk of deficiency in the group is very small.

Estimated Average Requirement

Energy intake is compared against the Estimated Average Requirement (EAR) for a group. Estimates of energy requirements for different populations are termed EARs and are defined as the energy intake estimated to meet the average (median) requirements of the group. About half the people in the group will usually need more energy than the EAR and half the people in the group will usually need less.

Dietary Reference Values

In 1991, the Department of Health published Dietary Reference Values (DRVs) which cover a range of intakes for most nutrients, and energy intakes[1]. Recommendations for protein, vitamins and minerals vary by age. DRVs for children have not been set for some of these nutrients.

Availability Factors

Prior to 2012, "availability factors" were applied to a range of foods that are purchased raw but generally eaten cooked, to take account of vitamin losses during cooking. The "availability factors" were applied to Vitamin B1, Vitamin B2, Niacin and Vitamin C and were a value between 0 and 1. The nutrient levels in foods are multiplied by the availability factor. Following a review in 2012, which highlighted some apparent inconsistencies in the choice of foods and values, it was decided to discontinue the use of these factors. This should be borne in mind when interpreting changes in some vitamin 'intakes' between 2011 and 2012.

Carotene and beta carotene

[1] Reference Nutrient Intakes from Department of Health, *Dietary Reference Values for Food Energy and Nutrients for the United Kingdom*, HMSO, 1991

Prior to 2012, total carotene intake was based on composition data for beta carotene only, as beta carotene is the main component. Retinol equivalent intake is a calculated value derived using both retinol and total carotene data. In 2012, the composition data for fruit and vegetables was updated using total carotene data. Other food groups will be updated with total carotene data as it becomes available. These changes in the basis of composition data for carotene partly explain the apparent increases in intake of carotene and retinol equivalent between 2011 and 2012.

Table 3 shows the Estimated Average Requirements (EARs) for energy and the Reference Nutrient Intakes (RNIs) for selected nutrients for different groups of people based on their age and sex.

Table 3: Estimated Average Requirements for energy and Reference Nutrient Intakes for selected nutrients [(a)]

		Children				Males				Females				Pregnant females
	Age:	Under 1	1 to 3	4 to 6	7 to 10	11 to 14	15 to 18	19 to 50	50+	11 to 14	15 to 18	19 to 50	50+	16 to 50
										reference nutrient intake per person per day				
Energy [(b)]	kcal	721	1197	1630	1855	2220	2755	2550	2340	1845	2110	1940	1877	2140
Protein	g	13.5	14.5	19.7	28.3	42.1	55.2	55.5	53.3	41.2	45.0	45.0	46.5	51.0
Calcium	mg	525	350	450	550	1000	1000	700	700	800	800	700	700	700
Iron	mg	5.4	6.9	6.1	8.7	11.3	11.3	8.7	8.7	14.8	14.8	14.8	8.7	14.8
Zinc	mg	4.5	5.0	6.5	7.0	9.0	9.5	9.5	9.5	9.0	7.0	7.0	7.0	7.0
Magnesium	mg	68	85	120	200	280	300	300	300	280	300	270	270	270
Sodium [(c)]	g	0.3	0.5	0.7	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Potassium	g	0.8	0.8	1.1	2.0	3.1	3.5	3.5	3.5	3.1	3.5	3.5	3.5	3.5
Thiamin	mg	0.2	0.5	0.7	0.7	0.9	1.1	1.0	0.9	0.7	0.8	0.8	0.8	0.9
Riboflavin	mg	0.4	0.6	0.8	1.0	1.2	1.3	1.3	1.3	1.1	1.1	1.1	1.1	1.4
Niacin equivalent	mg	4	8	11	12	15	18	17	16	12	14	13	12	13
Vitamin B6	mg	0.3	0.7	0.9	1.0	1.2	1.5	1.4	1.4	1.0	1.2	1.2	1.2	1.2
Vitamin B12	µg	0.3	0.5	0.8	1.0	1.2	1.5	1.5	1.5	1.2	1.5	1.5	1.5	1.5
Folate	µg	50	70	100	150	200	200	200	200	200	200	200	200	300
Vitamin C	mg	25	30	30	30	35	40	40	40	35	40	40	40	50
Vitamin A (retinol equivalent)	µg	350	400	500	500	600	700	700	700	600	600	600	600	700

(a) Department of Health, Dietary Reference Values for Food Energy and Nutrients for the United Kingdom, HMSO, 1991.
(b) Estimated Average Requirement
(c) The RNI for sodium is the amount that is sufficient for 97 per cent of the population. In May 2003 the Scientific Advisory Committee on Nutrition made recommendations about the maximum amount of salt that people should be eating, i.e. that the average salt intake for adults should be no more than 6 grams per day, equivalent to 2.4 grams of sodium per day.

Worked example calculating average RNI for UK population

To compare average intakes from food and drink against Reference Nutrient Intakes it is first necessary to obtain the average RNIs for the United Kingdom population. Table 4 shows the calculation of the average RNI across the UK population in 2004-05 for protein.

Table 4: Calculation of the UK weighted average RNI for protein in 2004-05

	RNI	Person count ('000 head)	RNI x person count
Children under 1	13.5	700	9,452
Children 1 to 3	14.5	2,006	29,084
Children 4 to 6	19.7	2,052	40,415
Children 7 to 10	28.3	2,908	82,305
Males 11 to 14	42.1	1,575	66,322
Males 15 to 18	55.2	1,636	90,282
Females 11 to 14	41.2	1,571	64,719
Females 15 to 18	45.0	1,462	65,792
Males 19 to 50	55.5	12,373	686,706
Males over 50	53.3	8,905	474,648
Females 19 to 50	45.0	12,626	568,186
Females 16 to 50 (pregnant)	51.0	413	21,081
Females over 50	46.5	10,085	468,951
Total		58,313	2,667,943

Weighted average RNI = Sum (RNI x person count)/ Sum (person count)
for protein 2004/05 = 2,667,943 / 58,313
= 45.8 grams per person per day

In Family Food Reports up to 2008 an allowance of 10 per cent was made for wastage (e.g. food left on the plate) of household food and drink. In 2004-05 the average UK intake of protein from household food was 70.6 grams per person per day.

Deducting 10 per cent for wastage gives an average of 63.6 grams per person per day. This (63.6/45.8) is equivalent to 139 per cent of the 2004-05 weighted average RNI for protein of 45.8 grams per person per day.

From 2009 onwards, no account was taken of food which was bought but not eaten.