

# Appendix 3

## Calculations of nutritional information

### Setting up a spreadsheet

It is commonly the case that not only a list of ingredients must be shown on the packaging for biscuits but also details of basic nutritional analysis.

It is convenient and relatively simple to calculate the nutritional values using ingredient analyses and the biscuit recipe. The accompanying spreadsheet gives an example for a digestive biscuit made from the recipe number 60 given in [section 6.2.1](#).

Such a spreadsheet is constructed in the following way:

- The ingredients are listed in column A.
- The recipe weights are entered in column B.
- In column C are entered the moisture contents of the ingredients or, in the case of chemicals, the loss in weight to be expected during baking.
- In column D the computer is set to calculate the 'dry' weights of each ingredient using data from columns B and C.
- In columns J, K, L, M analytical data about each ingredient is entered from ingredient suppliers' information or from tables, for example, from McCance and Widdowson.<sup>1</sup>
- In columns F, G, H, I the computer is set to calculate the total quantities of each component in each ingredient in the mix.
- All the columns of values are totalled.
- An estimate is made of the baked biscuit moisture content (in this case 2.5%) and using this and the weight of 'dry' ingredients (148.8) a value for the yield of biscuits from the mix can be calculated.
- In a separate table below, calculations for the values of energy, protein, carbohydrate and fat per 100 g of biscuit may be made. For example, the energy value is found by taking the value in I19 and dividing by B23  $\times 10$ .

Clearly, by using more detailed analyses of each ingredient such values as dietary fibre, saturated fatty acid and vitamins per 100 g of biscuit can also be calculated.

### **Another use of this analytical table**

Using a spreadsheet set up to make the calculations as shown the product developer can play ‘what happens if’ games to match recipes to the desired requirements, such as those of product fat and energy. This could be a very useful approach when the aim is to match a competitor’s product. The competitor’s product probably shows a list of ingredients (and these should be in descending order of magnitude) plus a compositional analysis of the product. By filling in a likely recipe, from experience or with the aid of recipes given in this book, the calculations of the composition can be compared with what is required. It is very easy to adjust the recipe until a near match of the composition is reached.

### **Reference**

- [1] HOLLAND, B et al (1991) McCance and Widdowson *The Composition of Foods, 5th edition*. Royal Society of Chemistry and MAFF, London.

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Ingredients Recipe	Wt per mix (kg) 60 Digestive	Moisture content (%) and loss during baking	'Dry' wt (kg)	Ingredient nutritional values in mix				Ingredient nutritional values, g/100 g from tables				
					Carbohydrate	Protein	Fat	Energy (kcal)	Carbohydrate	Protein	Fat	Energy (kcal)	
7	Fat	34.52	0	34.520	0.0	0.0	34 520.0	310 680	0	0	100	900	
8	Lecithin	0.70	0	0.700	0.0	0.0	700.0	6 300	0	0	100	900	
9	Sugar	22.00	0	22.000	22 000.0	0.0	0.0	88 000	100	0	0	400	
10	Cane syrup	3.18	20	2.544	2 512.2	9.5	0.0	9 476	79	0.3	0	298	
11	Amm. bicarbonate	0.47	100	0.000	0.0	0.0	0.0	0	0	0	0	0	
12	Sod. bicarbonate	1.69	50	0.845	0.0	0.0	0.0	0	0	0	0	0	
13	Tartaric acid	0.71	0	0.710	0.0	0.0	0.0	0	0	0	0	0	
14	Salt	1.29	0	1.290	0.0	0.0	0.0	0	0	0	0	0	
15	Water	9.00	100	0.000	0.0	0.0	0.0	0	0	0	0	0	
16				0.000	0.0	0.0	0.0	0					
17	White flour	81.57	14	70.150	63 379.9	7 667.6	1 060.4	285 495	77.7	9.4	1.3	350	
18	Wholemeal	18.67	14	16.056	11 930.1	2 371.1	410.7	57 877	63.9	12.7	2.2	310	
19					Totals	99 822.2	10 048.2	36 691.2	757 828				
20	Total wt of mix	173.80											
21	'Dry' wt			148.815									
22	Moisture of biscuits		2.5										
23	Yield of biscuits	152.54											
24													
25	<i>Nutritional values of biscuit per 100 g</i>												
26	Energy (kcal)	496.8											
27	Protein (g)	6.6											
28	Carbohydrate (g)	65.4											
29	Fat (g)	24.1											