



Garcia, A. L., McLean, K., and Wright, C. M. (2015) Types of fruits and vegetables used in commercial baby foods and their contribution to sugar content. *Maternal and Child Nutrition*, (doi:10.1111/mcn.12208)

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Deposited on: 20 September 2016

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1 **Types of fruits and vegetables used in commercial baby foods and their contribution to**  
2 **sugar content**

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26 Short running title: Fruits and vegetables in baby foods

27 Key words: complementary foods, processed baby foods, fruit sugars

28  
29 Disclosure: The authors have no conflict of interest.

30  
31 Author contributions

32 ALG study design, data analysis and interpretation. KM data acquisition and analysis, CW data  
33 analysis and interpretation. All authors contributed to manuscript drafting.

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37

38 **Abstract**

39

40 Fruits and vegetables (F&V) are often featured in names of commercial baby foods (CBF). We aimed

41 to survey all available CBF in the UK market with F&V included in the food name in order to

42 describe the amount and types of F&V used in CBF and their contribution to total sugar content. Food

43 labels were used to identify F&V and total sugar content. Fruits were more common than vegetables

44 in names of the 329 CBF identified. The 6 most common F&V in the names were all relatively sweet:

45 apple, banana, tomato, mango, carrot and sweet potato. The percentage of F&V in the foods ranged

46 from a median of 94% for sweet-spoonable to 13% for dry savoury products. Fruit content of sweet

47 foods (n=177) was higher than vegetable content of savoury foods (n=152) with a median (IQR) of

48 64.0g/100g (33.0-100.0) vs 46.0g/100g (33-56.7). Fruit juice was added to 18% of products. The

49 proportion of F&V in CBF correlated significantly with sugar content for all the food types except

50 dry-savoury food (sweet-spoonable  $r=0.24$   $P=0.006$ ; savoury-spoonable  $r=0.65$   $P<0.001$ ; sweet-dry

51  $r=0.81$   $P<0.001$ ; savoury- dry  $r=0.51$   $P=0.06$ ) and explained up to 2/3 of the variation in sugar

52 content. The F&V content mainly consists of fruits and relatively sweet vegetables which are

53 unlikely to encourage preferences for bitter tasting vegetables or other non-sweet foods. F&V

54 contribute significantly to the total sugar content, particularly of savoury foods.

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58 **Key Messages:**

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60 • Fruits are featured more than vegetables in the names of commercial baby foods.

61 • Sweet tasting vegetables such as carrot and sweet potato are used more frequently in the  
62 formulation of commercial baby foods, compared to those with a bitter taste.

63 • Total sugar content is positively correlated with fruit and vegetable content in commercial  
64 baby foods, particularly in spoonable foods (6.8g sugar/100g), suggesting that they may be  
65 used as sweetening agents.

66 • Commercial baby foods lack a variety of vegetable that will promote development of bitter  
67 tastes.

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## 71 **Introduction**

72 Low vegetable consumption in children is a public health concern. The health benefits of fruit and  
73 vegetable consumption, from childhood onwards, are well recognized (WHO/FAO, 2003) . However  
74 children tend to consume few vegetables (Organisation for Economic Cooperation and Development,  
75 2012, Gubbels et al., 2014). One barrier to early vegetable intake may be their bitter taste (Mennella,  
76 2014). Infants usually accept new foods and tastes well (Nicklaus, 2009) and if vegetable tastes are  
77 introduced early, they can be well accepted (Caton et al., 2014) and this early experiences influences  
78 food preference later in childhood (Mennella, 2014, Schwartz et al., 2011). This is one reason why  
79 complementary feeding advice encourages the use of F&V as first foods (NHS, 2012, The Scottish  
80 Government, 2013).

81 In Western countries commercial baby foods (CBF) are widely used to introduce babies to  
82 complementary food (Foterek et al., 2014, Siega-Riz et al., 2010). In the UK, the infant feeding  
83 survey in 2010 found that two thirds of mothers gave a CBF as a first solid food (mainly baby rice and  
84 ready-made baby food) while 45% mothers of 8-10 month old babies use them at least once/day  
85 (Health and Social Care Information Centre IFF Research, 2012). Similarly, the 2011 UK Diet and  
86 Nutrition Survey in Infants and Young Children found that 58% of 4 to 18 month old children on  
87 solids had eaten a commercial baby or toddler meal over the 4 days survey period (Lennox et al.,  
88 2013). CBFs commonly list fruits and vegetables (F&V) as ingredients (Garcia et al., 2013), yet a  
89 recent longitudinal study found that higher use of CBF was associated with lower intake of F&V in  
90 infancy which persisted into school age for boys (Foterek et al., 2015). This may be because the  
91 range and amount of F&V used was low, as already described in the USA and Germany (Siega-Riz et  
92 al., 2010, Mesch et al., 2014). Still the variety and amounts of F&V used in the formulation of CBF  
93 has not been clearly explored.

94 In contrast to bitter tastes, infants have an innate preference for sweet foods (Cowart, 1981). Current  
95 complementary feeding advice discourages the use of added sugars to baby food in order to establish  
96 lower thresholds for sweet tastes (NHS, 2012). Additionally, there are strict regulations on the  
97 amounts and types of sugars used in baby foods manufacturing (European Commission, 2006) . It  
98 has been shown that sweet products dominate the UK commercial baby food market and that 80% of  
99 these products listed fruit in their titles (Garcia et al., 2013). However that analysis did not gather  
100 information on the exact F&V content and thus the extent to which F&V contributed to the nutritional  
101 quality of the foods. We thus aim to conduct a new survey to describe the type and amount of F&V  
102 used in CBF in the UK and how this related to total sugars content.

103

104 **Methods**

105 ***Data collection***

106 A database was created using information from the food labels of CBF which were defined as food  
107 lines marketed for complementary feeding, predominantly for infants under one year. The baby foods  
108 surveyed were all the products of seven large baby food companies in the UK market: Organix, Hipp  
109 Organic, Heinz, Ella's Kitchen, Cow and Gate, Boots and Plum Baby (Brandwatch, 2012, Key Note,  
110 2006). All foods which contained individual fruits or vegetables in the name of the product (e.g.  
111 "banana dessert") or the term "fruit" or "vegetable" (e.g. "vegetable casserole") were identified and  
112 food label information obtained, mostly through the manufacturer's website. If the information was  
113 not available, supermarket websites (Tesco and Ocado) or labels in store were used. Fruit juices,  
114 smoothies and other drinks were excluded from the study. The products were packaged in jars,  
115 pouches, sachets, boxes, bags and flow wrap. All data was collected in May 2013. We did not aim in  
116 this paper to record all baby foods, because our focus was on fruit and vegetable content. From a  
117 previous study we can infer that two thirds (~66%) of the total baby foods contained fruit, vegetables  
118 or both in their names (Garcia et al., 2013)

119 The variables entered in the database followed a similar protocol to a previous publication (Garcia et  
120 al., 2013). The variables entered included: brand, name of product, recommended age, food type  
121 (these were *wet*, which included spoonable, pureed foods which will be referred as "spoonable" foods  
122 in the text and *dry* which included biscuits, dry breakfast cereals, rusks and dry finger food such as  
123 baby snacks) and number of ingredients.

124 From the food name, the first 3 F&V listed were recorded for each product in order of appearance.  
125 From the ingredients list the form in which the fruit or vegetable was reported  
126 (fresh/dried/powder/oil/juice), grams per 100g of each F&V, total grams of fruit and/or vegetable per  
127 100 grams, whether the food had mixed F&V content, total juice content per 100 grams, number of  
128 different juices, if fruit juice was clearly labeled this was then considered as a fruit and recorded alone  
129 but also added to a variable which included the total amount of fruit and/or vegetables g/100g  
130 (including juice). For many ingredients it was not possible to know individual fruit or vegetable  
131 content as it was not clearly stated; for example, "vegetable 35% (sweet potato 18%, butternut squash,  
132 courgette)" in this cases mixed vegetables was recorded. Similarly when a combination of fruits  
133 without exact weight contribution was found, the recorded variable was mixed fruit. Potato alone was  
134 not considered as a vegetable in this study, however in some cases the potato content could not be  
135 discriminated from the vegetable ingredients. For example, "vegetable 49% (potato, parsnip, carrot,  
136 swede, broccoli)"; these products were listed as mixed vegetable. The products that listed potatoes in  
137 the list of vegetable ingredients were 25 (7%). Tomatoes were considered as vegetables because of  
138 their predominant use as part of savoury dishes.

139 Products were classified as sweet or savoury based on the product's name. Sweet products were those  
140 that only contained fruit or contained the words "pudding" "crumble" "dessert" or "cake" in the name.

141 There were a few products which could not be easily classified, due to a mix of fruit and vegetables,  
142 for this we looked at the major (>50%) ingredients, if these were fruits then the product was classified  
143 as sweet. All meat, chicken, fish, cheese, vegetable and carbohydrate based dishes (e.g. pasta, rice,  
144 potato- based) were classified as savoury. If the product was meat based, but also contained a fruit in  
145 the name (for example “Pork and Apple” or “Fruity Chicken”) the product was classified as savoury. .  
146 For nutritional information energy, protein, fat and carbohydrate content were recorded. In addition,  
147 total sugar content (independent from total carbohydrate content) was also recorded exactly as  
148 reported in the label. According to the European Safe Authority total sugars are “both indigenous  
149 (sugars naturally present in foods such as fruit, vegetables, cereals and lactose in milk products) and  
150 added sugars” (European Food Safety Authority, 2009). “Added sugars” refers to sucrose, fructose,  
151 glucose, starch hydrolysates (glucose syrup, high-fructose syrup, isoglucose) and other isolated sugar  
152 preparations used as such, or added during food preparation and manufacturing (European Food  
153 Safety Authority, 2010). “Relatively sweet” vegetables were those which contained  $> 4$  g of  
154 sugar/100g such as tomatoes (4.4g), carrots (4.7g), parsnips (4.8g), peas (5.6g), sweet potato (6.5g)  
155 while non-sweet vegetables were those containing  $< 4$ g of sugar such as broccoli (1.7g), cauliflower  
156 (3.1g), spinach (0.42) (USDA, 2015).

157

### 158 ***Statistical analysis***

159 All statistical analyses were done using SPSS data software (SPSS, Chicago, Illinois, USA, Version  
160 19). The association between F&V and sugar content was explored using linear regression separately  
161 for sweet-spoonable, savoury-spoonable, sweet-dry and savoury-dry foods because of widely varying  
162 average sugar contents in each group.

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164

165 **Results**

166

167 ***General characteristics and nutritional content***

168 There were 329 baby food products labeled as containing fruits or vegetables or both in the name. The  
169 majority of products were wet, spoonable foods (83.4%) followed by dry finger foods (10.6%) and  
170 dry baby breakfast cereals/powdered food (5.8%). The amount of foods recommended at age 4+  
171 months was 157 (47.7%), followed by 97 foods at age 6-7+ months (29.5%), 29 foods at age 9-10+  
172 months (8.8%) and 46 foods at age 12+ months (14%). Overall just over half the food names  
173 suggested a sweet taste (n=177, 53.8%; Table 1). Sweet foods were commonest in the age group 4+  
174 months. Dry finger foods were mainly sweet (n=40, 74%) and, as expected, targeted mainly to age 6-7  
175 months (33%) and 12+ months (40%). The nutritional content of CBF is shown in Table 2.

176 ***Fruit and vegetable content and association with sugar content***

177 Fruits were more commonly featured in the names of CBF than vegetables (n=198, 60% vs. n=155,  
178 47%), while 7% (n=24) featured both. Foods targeted to age group 4+months were mostly fruit based  
179 (n=118, 75%) . The types of F&V most used in names of CBF are shown in Table 3 and were  
180 relatively sweet. The most common first named F&V single ingredient was apple followed by banana,  
181 tomato, mango, carrot and sweet potato . Mixed vegetables, usually labeled as “vegetables” and  
182 mixed fruit labeled as “fruit or fruity” were reported in a large number of products. The median  
183 number of F&V (including juice) described in the ingredient list was 3 (minimum of 1 and a  
184 maximum of 11).

185 The F&V content of the most common F&V used in the names and reported in the ingredient list are  
186 shown in Table 4. Apples are the most frequent fruit used as ingredient and also had the highest  
187 median content. Carrots were the most frequent used vegetable but were second in median content  
188 contribution after tomatoes. Mixed vegetables are widely used in CBF and represent the highest  
189 median content. Mixed fruit is also a common ingredient with a median content in the top four  
190 ingredients. There was also a median of 15g/100g added fruit juice in 59 (18%) products. The  
191 proportion of F&V in each food varied from as low as 3% up to 100% and because of these large  
192 variations the median values are shown according to types of foods (Figure 1, Panel A and B). F&V  
193 content of spoonable foods was high for sweet foods, with F&V making up a median of 94% for  
194 sweet-spoonable and 50% for savoury-spoonable. Sweet-dry products had a lower median content of  
195 34% and 13% for savoury-dry. The proportion of F&V in the food correlated significantly with sugar  
196 content for all the food types except savoury solid food (sweet-spoonable  $r=0.24$   $P=0.006$ ; savoury-  
197 spoonable  $r=0.65$   $P<0.001$ ; sweet-dry  $r=0.81$   $P<0.001$ ; savoury-dry  $r=0.51$   $P=0.06$ ) and explained up  
198 to 2/3 of the variation in sugar content (Figure 2, Panel A and B).

199



## 200 Discussion

201 Vegetable intake in children in the UK and other Western countries remains low (Department of  
202 Health, 2011, Lennox et al., 2013) and promoting the intake of F&V during childhood is a key public  
203 health message. The healthiness of F&V is clearly recognized by parents and manufacturers, since the  
204 great majority of complementary feeding products list F&V in their names (Garcia et al., 2013). This  
205 survey has revealed that the amount of F&V used in these products is substantial, comprising an  
206 average of 60% of spoonable foods, but a majority of the foods recommended for early use (4+  
207 months) were fruit based and where vegetables were used they were predominantly sweet, with bitter  
208 tasting vegetables rarely included. The proportion of F&V content varied greatly, but it was of note  
209 that the greater the proportion, the sweeter the food, suggesting that their main function of F&V in the  
210 products may be as sweetening agents. Furthermore, as previously discussed by others (Garcia et al.,  
211 2013), it is a matter of concern that a large proportion of CBF are recommended from 4 months of age  
212 which adheres to EU regulations but contradicts current WHO recommendations on the appropriated  
213 age of weaning.

214 The foundation for food preferences in later childhood are laid by early food exposure, so  
215 complementary foods are an ideal opportunity to form new tastes (Maier et al., 2007). Introducing  
216 babies to *single* foods and repeated exposure to the same food over several days has been shown to  
217 favour acceptance (Birch et al., 1998) and using vegetables exclusively when starting complementary  
218 feeding has been shown to increase vegetable intake (Barends et al., 2013) for up to 12 months  
219 (Barends et al., 2014). However the commercial foods in this study had a median number of 3 F&V  
220 per food and thus are not ideal for flavour learning. Experimental trials using flavour-flavour learning  
221 to study children's acceptance of vegetables normally combined one vegetable with one sweet  
222 ingredient (e.g. glucose), rather than a mix of F&V (Caton et al., 2014, Remy et al., 2013). The key  
223 finding however was that bitter vegetables such as brassicas, spinach and chards were little used in  
224 these foods, only as a small proportion. A low variety of vegetables as key ingredients in CBF and  
225 the use of sweet vegetables has also been reported for CBF in Germany, with carrots being most  
226 popular (Mesch et al., 2014). This probably reflects commercial pressure to produce instantly  
227 palatable foods, since infants have an innate preference for sweet flavors and to avoid bitter tastes  
228 (Beauchamp and Mennella, 2009). It has also been reported that UK mothers are more likely to make  
229 weaning solids with mixed vegetables during weaning (Caton et al., 2011). It could be argued that  
230 combining new flavours with sweet tastes would also increase acceptance, but one RCT found that  
231 repeated exposure to a novel vegetable (artichoke) was no more effective in increasing vegetable  
232 acceptance than combination with a sweet component (Remy et al., 2013). Altogether this suggests  
233 that the F&V used in these foods may be used to increase the palatability of foods, but they are likely  
234 to be ineffective in promoting taste acceptance of vegetables.

235

236 Given the natural sugar content of fruits it was not surprising that the F&V content of sweet dry foods  
237 explained two thirds of their variation in total sugar content. What was unexpected was that the F&V  
238 content of savoury spoonable foods also correlated highly with total sugar content. This reflects the  
239 types of sweet vegetables found in these foods. European Union guidelines limit the addition of non  
240 milk extrinsic sugars (NEMS, “added sugars”) such as “sucrose, fructose syrups or honey” in CBF  
241 (European Commission, 2006), but using F&V increases the total sugar content without the need to  
242 use added sugars. The risk is that while parents think that CBF are introducing their child to healthy  
243 vegetable tastes, actually they are mainly reinforcing preferences for sweet foods. **Current**  
244 **recommendations for total sugar intake in babies are that total sugar intake should be “around” 40%**  
245 **of total energy intake, a number based on the average total lactose intake in breastfed babies**  
246 **(Department of Health, 1991). Just as we previously found with total energy content (Garcia et al.,**  
247 **2013) the sugar content of spoonable CBF average mirrors that of breast milk: if a 6-8 old month baby**  
248 **ate 303g of spoonable CBF to the WHO recommended intake of 200Kcal/day from complementary**  
249 **foods (WHO, 2000), they would get exactly 40% energy intake from total sugars from CBF (20.6 g**  
250 **total sugar/day, which amounts to a total of 82Kcal from total sugars). Thus, as long as the baby eats**  
251 **a mix of savoury and sweet foods and no more than the recommended amount, the amount of sugar in**  
252 **these foods would not exceed recommendations, though we do not know if that is a healthy pattern for**  
253 **complementary feeding. Thus, further research on feeding patterns with predominant use of CBF in**  
254 **the development of food preferences later in life is needed.**

255 The strength of this study is that it represents a near complete survey of baby foods on the market in  
256 the UK listed as containing F&V, though it is possible we have missed further products that may have  
257 been flavoured or sweetened with F&V if this was not specified in the label. A limitation is that we  
258 cannot know how applicable this would be in other countries, but as EU directives regulate the  
259 content of baby foods across Europe, it seems likely to be relevant to other parts of Europe. It is also  
260 by necessity a snap shot as manufacturers change their products on a constant basis, but by examining  
261 all the then available products one gets an overview of the market approach, which is less likely to  
262 change. The applicability of our findings to American markets is less clear, but recent studies suggest  
263 a lot of similarity, in particular to low vegetable variety (Siega-Riz et al., 2010) and high sugar  
264 content (Cogswell et al., 2015). We must rely on the contents as reported by the manufacturers but a  
265 recent study in a sample of infant foods in the UK suggest that the macronutrient content reported by  
266 manufactures reflect the declared values (Zand et al., 2012). Furthermore, the nutrient content in this  
267 survey is consistent with data reported in a similar study (Garcia et al 2013). It must also be born in  
268 mind that CBF form only part of the diet of most babies (Lennox et al., 2013), so we cannot comment  
269 on how this would translate to an infant’s total dietary intake, which is beyond the scope of this  
270 survey.

271  
272 **Conclusions**

273 The types of vegetables used in CBF are predominantly sweet and non-bitter and thus will not  
274 encourage preferences for non-sweet vegetables. F&V contribute significantly to sugar content in  
275 CBF evidencing their sweetness and suggesting that they are used as sweetening agents. There are  
276 implications from these results for practitioners and parents. Manufacturers clearly recognise  
277 commercial demand for products that appear healthy, but commercial pressure on them will be to  
278 ensure that these products are highly palatable. While taste learning requires parents to introduce their  
279 children to less palatable bitter tastes and keep offering them, it is probably unrealistic to expect that  
280 commercial products will assist in this process. Thus practitioners need to be aware when advising  
281 parents on complementary feeding that CBF, even if containing vegetables, are unlikely to help their  
282 child develop a taste for bitter vegetables and parents still need to be encouraged to cook and offer  
283 home prepared vegetables to promote taste acceptance..

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289 **Table 1. Number and proportion of spoonable foods at each age that were sweet or savoury**  
 290 **(n=329)**  
 291

Age group	Sweet		Savoury		Total	
	N	%	N	%	N	%
4+	109	69.4	48	30.6	157	47.7
6-7+	38	39.2	59	60.8	97	29.5
9-10+	6	20.6	23	79.3	29	8.8
12+	24	52.2	22	47.8	46	14.0
Total	177	53.8	152	46.2	329	100

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 294

295 **Table 2. Nutritional content of commercial baby foods containing fruit or vegetables by food**  
 296 **type (n=329).**

297  
 298

Food		Number	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)	Sugar (g)	Min	Ma
Spoonable	Sweet	137	68.6 (19.4)	1.02 (0.8)	0.65 (0.8)	13.71(3.1)	10.74 (2.6)	5.2	23
	Savoury	138	64.0 (13.8)	2.77 (0.9)	1.75 (0.9)	8.51 (1.8)	2.88 (1.7)	0.1	10
	Total	275	66.3 (16.9)	1.9 (1.2)	1.2 (1.0)	11.1 (3.6)	6.8 (4.5)	0.1	23
Dry	Sweet	40	354.6 (76.9)	7.40 (3.9)	6.76 (5.2)	66.05 (15.3)	25.69 (16.9)	1.7	69
	Savoury	14	416.2 (32.1)	9.14 (3.0)	11.54 (5.4)	69.81 (9.0)	7.09 (3.6)	1.5	12
	Total	54	370.6 (73.1)	7.8 (3.7)	8.0 (5.6)	67.0 (13.9)	20.9 (16.8)	1.5	69

299 **Table 3. Most frequently named F&V in CBF (n=329)**  
 300

	1 <sup>st</sup> F&V named in label	2 <sup>nd</sup> F&V named in label*	3 <sup>rd</sup> F&V named in label†
	Frequency (%)		
Apple	59 (17.9)	24 (7.3)	6 (1.8)
Vegetables (not specific)	44 (13.4)	1 (0.3)	
Banana	33 (10.0)	19 (5.8)	7 (2.1)
Tomato	23 (7.0)	1 (0.3)	
Fruit (no specific)	19 (5.8)	1 (0.3)	
Mango	19 (5.8)	6 (1.8)	5 (1.5)
Carrot	17 (5.2)	6 (1.8)	2 (0.6)
Sweet potato	16 (4.9)	8 (2.4)	
Butternutsquash/pumpkin/courgettes	14 (4.3)	4 (1.2)	1 (0.3)
Strawberry	13 (4.0)	4(1.2)	3 (0.9)
Raspberry/blueberry	10 (3.0)	9 (2.7)	2 (0.6)
Pear	7 (2.1)	21 (6.3)	2 (0.6)
Peach	7 (2.1)	11 (3.3)	3 (0.9)
Broccoli/cauliflower	7 (2.1)	4 (1.2)	
Sweet corn	6 (1.8)	1 (0.3)	
Spinach	6 (1.8)	--	1 (0.3)
Parsnips	5 (1.5)	2 (0.6)	2 (0.6)
Red pepper	4 (1.2)	3 (0.9)	
Raisin/sultana	4 (1.2)	6 (1.8)	
Plums/prunes	3 (0.9)	1 (0.3)	
Apricot	2 (0.6)	8 (2.4)	
Peas	1 (0.3)	2 (0.6)	3 (0.9)
Swede	0	0	3 (0.9)
Other‡	10 (3.0)	10 (3.0)	4 (1.2)
<b>Total</b>	<b>329 (100)</b>	<b>151 (45.9)</b>	<b>44 (13.4)</b>

301 \*A second F&V was not included in name in 178 products (54.1%)

302 †A third F&V was not included in name in 285 products (86.6%)

303 ‡ Other fruits were kiwi, date, orange, blackcurrant and lemon. Other vegetables were parsley, red  
 304 cabbage, French bean, mushroom, aubergine.

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306

307

308 **Table 4. Content of individual F&V for CBF reporting a > 0.5g/100g of that F&V, ranked by**  
 309 **median content**  
 310

	N (%) <sup>*</sup>	Median (g/100g)	1 <sup>st</sup> quartile (g/100g)	3 <sup>rd</sup> quartile 3 (g/100g)	Minimum- Maximum (g/100g)
<b>Fruit</b>					
Apple	116 (35.0)	45.0	15.5	45.0	2-100
Pear	34 (10.3)	37.5	17.7	65.0	4-100
Plums/prunes	5 (1.5)	33.0	14.0	43.5	12-51
Mixed fruit	5 (1.5)	33.0	20.0	45.0	13-50
Banana	79 (24.0)	20.0	13.0	20.0	3-100
Peach	23 (6.9)	20.0	15.0	30.0	3-48
Raisin/sultana	20 (6.0)	15.5	10.2	33.8	2-85
Mango	33 (10)	13.0	7.5	20.0	3-100
Apricot	15 (4.5)	11.0	9.0	22.0	3-29
Strawberry	21 (6.4)	10.0	8.5	19.0	1-25
Raspberry/blueberry	21 (6.3)	5.0	3.5	15.0	1-23
<b>Vegetables</b>					
Mixed vegetable	64 (19.4)	34.5	26.2	46.0	3-73
Tomato	40 (12.2)	28.5	8.3	27.0	2-70
Cauliflower	4 (1.2)	28.5	13.5	35.2	10-36
Carrot	65 (19.7)	20.0	11.0	27.5	3-78
Parsnips	11 (3.3)	19.0	13.0	30.0	10-50
Spinach	7 (2.1)	18.0	5.0	22.0	3-34
Butternutsquash/ pumpkin/courgetes <sup>†</sup>	14 (4.3)	14.0	10.0	22.0	2-43
Sweet corn	13 (3.9)	14.0	5.5	26.0	3-51
Peas	11 (3.3)	12.0	6.0	20.0	4-30
Swede	7 (2.1)	12.0	5.0	20.0	4-25
Broccoli	8 (2.4)	8.0	5.5	22.7	4-27
Red pepper	18 (5.5)	7.0	4.0	9.0	1-13

311 <sup>\*</sup>Calculated from the total products n=329

312 <sup>†</sup>Butternutsquash, pumpkin and courgete were grouped

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326 **Figure legends**

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328 Figure 1. Fruit and vegetable\* content by food type (n=329)

329 Panel A. Sweet foods. Panel B. Savoury foods

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331 Figure 2. Associations between sugar and fruit and vegetable content. Foot note: Panel A. Spoonable

332 foods (n=275). Panel B, Dry foods (n=54).

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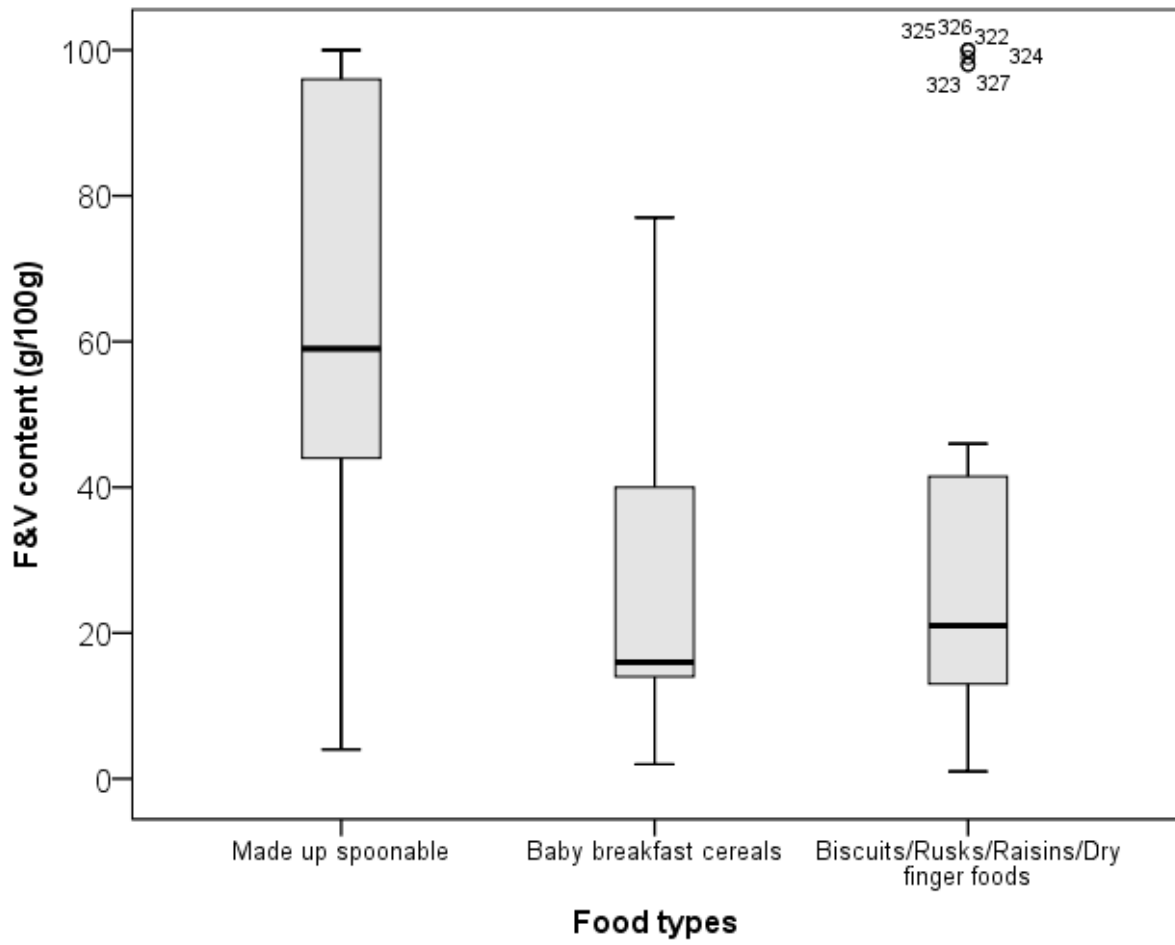
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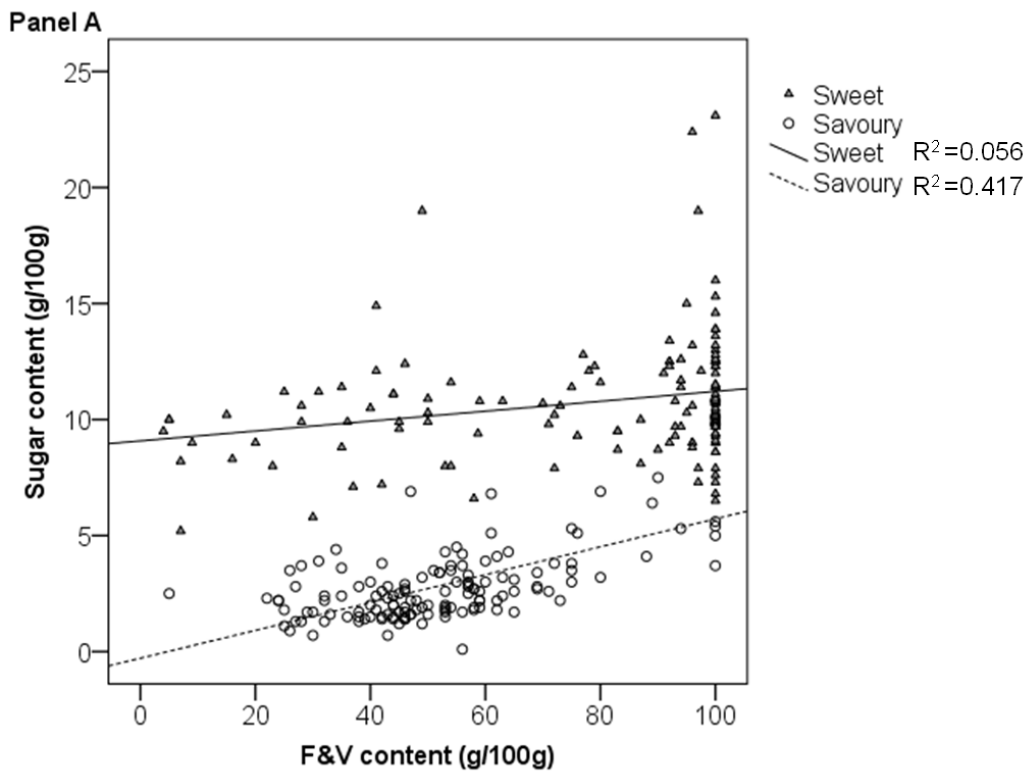
433 **Figure 1.**

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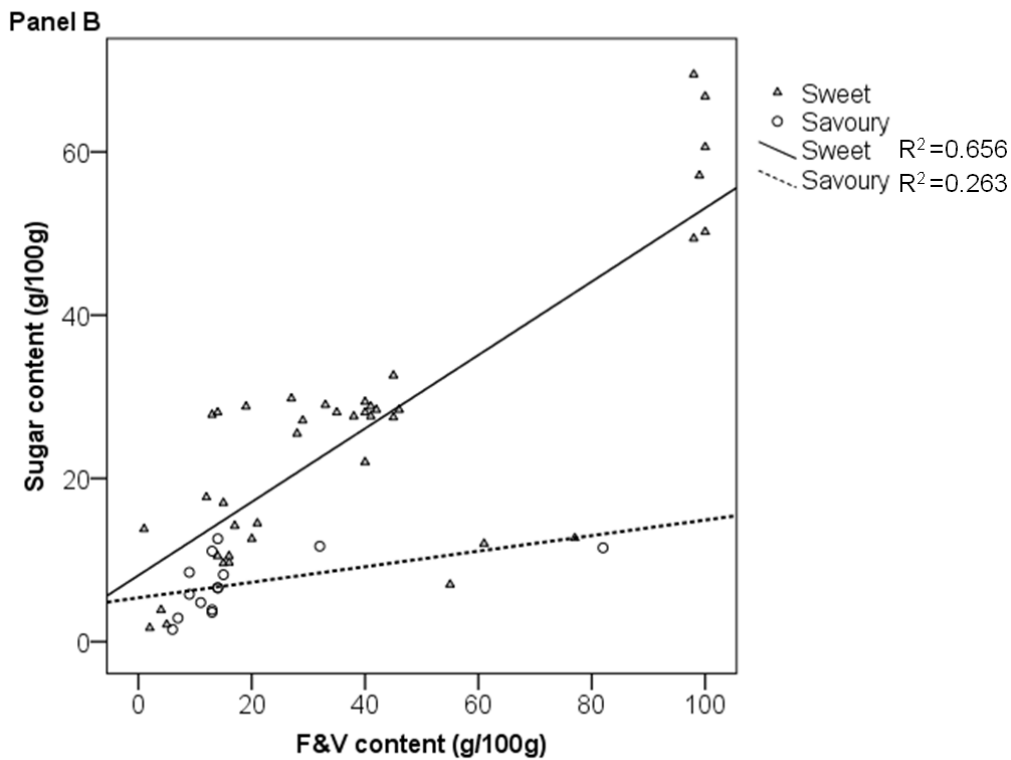


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457 Figure 2. .



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