

## How much is ‘5-a-day’?: consumer knowledge of fruit and vegetable portion sizes

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Research has shown that a diet rich in fruit and vegetables (FV) may provide protection against certain chronic illnesses including cardiovascular diseases<sup>(1)</sup>. Based on such evidence, the World Health Organisation set a minimum daily target of 400 g FV (the equivalent of five 80 g portions), which has been termed the ‘5-a-day’ public health message in the UK. Despite this, evidence shows that people in Northern Ireland still have an insufficient intake of FV<sup>(2)</sup>. A number of studies have proposed that knowledge is an important factor affecting FV intake and adherence to nutritional guidelines<sup>(3)</sup>. However, to date there is minimal research on the level of knowledge consumers have on FV portion sizes, which could be an important determinant in adherence to the ‘5-a-day’ message. Hence, the objective of the current study was to assess the knowledge of FV portion sizes in a sample of low FV consumers ( $\leq 2$  portions/day).

The study sample was comprised of 30 low FV consumers who were recruited to take part in a FV dietary intervention. Participants completed a questionnaire at baseline which assessed knowledge of four key areas: awareness of FV guidelines; identification of foods which are classified as a fruit or vegetable according to the ‘5-a-day’ message; portion sizes of commonly consumed FV; and total portions provided by a combination of FV (to reflect normal dietary patterns). Descriptive statistics were used to analyse questionnaire responses. Spearman’s Rank Correlation Coefficients and Mann-Whitney U Tests were used to examine associations between knowledge scores and demographic variables, as well as to establish if BMI correlated with under or over-estimation of portion size.

Results from the questionnaire identified knowledge gaps in two of the four areas assessed (see table below). All participants ( $n = 30$ ) claimed to be aware of FV guidelines and scored well when asked to identify foods that are classified as FV. Respondents did not score as well when asked to estimate how many portions examples of FV counted as according to the ‘5-a-day’ message, individually or for FV combinations. Neither total, nor subscale, knowledge scores were significantly associated with habitual FV intake (all  $p > 0.05$ ). Furthermore, knowledge scores were not associated with other demographic variables including age, years of education, gender or BMI (all  $p > 0.05$ ). In 73% of cases, individuals’ perception of how many portions different amounts of FV equated to was greater than in the ‘5-a-day’ guidelines. There was no significant relationship between over/under estimating portions and BMI ( $p = 0.40$ ), but females were more likely to overestimate portions ( $p = 0.02$ ). As correlations were weak, it was unnecessary to perform a multivariate test of effects.

	Number of questionnaire items per domain	Median Score		Score as a %	
		Median	IQR <sup>1</sup>	Median	IQR <sup>1</sup>
<b>Overall knowledge score</b>	73 <sup>2</sup>	47.7	45.7, 49.0	65.1	62.7, 67.1
<i>Subscales</i>					
Awareness of FV guidelines	1	1.0	1.0, 1.0	100	100, 100
Identifying FV	39	35.0	33.0, 38.0	91.0	84.6, 97.4
Portion sizes of individual FV	27	10.0	9.0, 12.0	37.0	33.3, 44.4
Portion sizes of combinations of FV	7	1.5	1.0, 3.0	21.4	14.3, 42.9

<sup>1</sup>IQR: Interquartile Range. <sup>2</sup>Awareness of FV guidelines was not included in FV portion size knowledge score.

In conclusion, this study suggests that whilst consumers are aware of FV guidelines, they lack knowledge on FV portion size. The results indicate that consumers might underestimate the amount of FV required to achieve the ‘5-a-day’ guidelines.

1. Dauchet L, Amouyel P, Hercberg S *et al.* (2006) *J Nutr* **136**, 2588–2593.
2. Scarborough P, Morgan RD, Webster P *et al.* (2011) *BMJ Open* **1**, 1–7.
3. Shaikh A, Yaroch R, Nebeling L (2008) *Am J Prev Med* **34**, 535–543.