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Fruit juice consumption in the National Diet and Nutrition Survey (NDNS 2008–2010): associations with diet quality and indices of obesity and health

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Fruit juice (FJ) can provide significant quantities of essential micronutrients, such as potassium, magnesium, folate, vitamin A and vitamin C as well as polyphenolic compounds. FJ consumption has been associated with superior dietary quality⁽¹⁾ and with cardiovascular benefits including improved endothelial function⁽²⁾ and reduced risk of stroke⁽³⁾.

This study analysed 2 years of data (2008–2010) from the National Diet and Nutrition Survey (NDNS) using files obtained from the UK Data Archive⁽⁴⁾. The purpose was to explore associations between fruit juice consumption and dietary quality (macro- and micronutrient intakes), socio-demographic and lifestyle factors and health indices, including anthropometric measures. NDNS is a cross-sectional survey on a rolling basis, 4-day food diaries were available for 2126 respondents (*n* 1095 children aged 1 to 18 y; *n* 1031 adults aged 19yrs upwards). Data were weighted to account for sampling and non-response bias. Consumers of (100%) FJ were defined as those who recorded drinking any FJ during the survey. Regression was used to adjust for effects of age and sex on anthropometric indices.

Mean FJ consumption over the total population was 70 g/d, (146 g/d among consumers). FJ consumption was associated with higher dietary quality (% of RNI) and lower risk of inadequacy (% <LRNI) for several micronutrients. FJ consumers ate more fruit and vegetables than non-consumers and were more likely to achieve the 5-a-day target. Children who consumed FJ also consumed fewer soft drinks (both sugar-sweetened and low calorie) and savoury snacks but this was not observed for adults. FJ consumers had lower BMI (adjusted mean difference -1.2 kg/m^2 for adults $P = 0.001$; -0.6 kg/m^2 for children, $P = 0.003$). Adult consumers also had lower waist circumference (-2.9 cm , $P = 0.002$) than non-consumers. They were also more likely to have higher education and higher income, to be non-smokers and to rate their health as very good.

		Child			Adult		
		non-consumer	consumer	<i>P</i> value	non-consumer	consumer	<i>P</i> value
Fruit juice	Valid N	500	595		608	423	
	Mean g/d	0	155		0	133	
Fruit and vegetables (excl. juice)		168	204	<0.0001	263	334	<0.0001
Soft drinks (non-diet) mean g/d		213	176	0.013	112	136	ns
Soft drinks (diet) mean g/d		215	160	0.003	95	74	ns
Magnesium	Mean as % RNI	99	114	<0.0001	87	95	<0.0001
Potassium	Mean as % RNI	111	130	<0.0001	78	87	<0.0001
Folate	Mean as % RNI	131	156	<0.0001	126	144	<0.0001
Vitamin A	% <LRNI	10.7%	7.2%	0.038	8.2%	3.4%	0.001
Vitamin C	% <LRNI	1.4%	0.0%	0.004	1.0%	0.0%	0.04

FJ consumption contributes to better dietary quality, did not displace whole fruit and vegetables, and is a marker for healthier diet and lifestyle. Consuming FJ was associated with leanness rather than obesity, although no causal inferences can be drawn. Exploration of dietary patterns and confirmation of the observed associations using biochemical and haematological status measures is desirable. From current evidence it would seem that moderate consumption of fruit juice should be positively encouraged on nutritional grounds, especially as less than half the population currently consume fruit juice regularly.

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1. O'Neil CE, Nicklas TA, Rampersaud GC, *et al.* (2011) *Nutr Res* **31**, 673–682.
2. Buscemi S, Rosafio G, Arcoleo G *et al.* (2012) *Am J Clin Nutr* **95**, 1089–1095.
3. Cassidy A, Rimm EB, O'Reilly EJ, *et al.* (2012) *Stroke* **43**, 946–951.
4. Link to UK Data Archive. <http://www.esds.ac.uk/findingData/snDescription.asp?sn=6533>.