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A beetroot juice shot is a significant and convenient source of bioaccessible antioxidants

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The most recent national diet and nutrition survey (NDNS) revealed that two thirds of the UK population still do not consume five portions of fruit and vegetables per day⁽¹⁾. Innovative and convenient new products are required to help inspire people to improve their diet. Beetroot juice is rich in antioxidants, particularly polyphenolic compounds⁽²⁾. The total antioxidant capacity (TAC) and total polyphenol (TP) content of a beetroot juice shot (70 ml) was examined following *in vitro* digestion. TAC was assessed using the ferric reducing antioxidant power (FRAP) assay and TP content was measured using the Folin Ciocalteu (FC) method (measured as gallic acid equivalents (GAE)) before and after an *in vitro* digestion procedure with simulated gastric and duodenal phases.

Product	FRAP (μmol)		FRAP post digestion (μmol)		TP (mg GAE)		TP post digestion (mg GAE)	
	70 ml	SE	70 ml	SE	70 ml	SE	70 ml	SE
James White beetroot shot	697.9	1.6	1740.3†	21.1	68.4	0.3	223.2†	5.4
James White beetroot juice*	584.8	5.9	850.6	23.5	101.5	2.9	106.9	1.3
V8 Vegetable juice*	180.1	3.4	244.2	15.6	43.2	1.1	74.7	0.5
V8 Fruit and vegetable juice*	144.8	3.4	349.0	10.3	37.6	1.3	76.8	0.5
Del Monte tomato juice*	154.1	2.8	215.0	3.6	48.7	1.4	78.4	0.9
Eden organic carrot juice*	107.3	0.8	191.9	1.5	33.2	0.5	71.6	0.3

* Published values are given for comparative purposes only, and are not included in the statistical analysis for this experiment. Results are expressed as mean (SE) of three experiments in triplicate. 'Post digestion' refers to TAC following the duodenal phase of the *in vitro* digestion procedure. † Significantly increased compared with the juice prior to digestion, $P < 0.01$.

The beetroot shot had a high TAC (697.9 μmol/70 ml) and TP content (68.4 mg GAE/70 ml). FRAP values increased significantly ($P < 0.01$) after the gastric phase (2361.2 μmol/70 ml) and remained significantly higher ($P < 0.01$) following the duodenal phase (1740.3 μmol/70 ml). TP content also increased significantly ($P < 0.01$) following the gastric phase (341.6 mg GAE/70 ml) and remained significantly higher ($P < 0.01$) following the duodenal phase (223.2 mg GAE/70 ml). The beetroot shot delivers a high amount of bioaccessible antioxidants in comparison with other vegetable juices per 70 ml serving. As a result it may be considered as a cost effective and convenient method of increasing antioxidant status in the general public. Human intervention studies are now required to determine the effects of the beetroot shot *in vivo*.

1. Bates B (2010) *National Diet and Nutrition Survey* pp. 1–53 [B. Bates, A. Lennox & G. Swan editors]. London: Food Standards Agency.
2. Wootton-Beard PC, Moran A & Ryan L (2011) *Food Res Int* **44**, 217–224.