Article

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Fallon, Naomi, Ennion, S.M, Karuri, Angela Njoki and Dillon, Stephanie ORCID: 0000-0002-3369-8199 (2018) Comparison of micronutrient intakes in adult females in the north-west of England following omnivorous, vegetarian and vegan diets. Proceedings of the Nutrition Society, 77 (OCE2). ISSN 0029-6651

Proceedings of the Nutrition Society (2018), **77 (OCE2)**, E38 doi:10.1017/S0029665118000320

Spring Conference 2018, 26–27 March 2018, Nutrient-nutrient interaction

Comparison of micronutrient intakes in adult females in the north-west of England following omnivorous, vegetarian and vegan diets

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This abstract was awarded the student prize.

Vegan and vegetarian diets are becoming increasingly popular in the UK with 3.25% of adults surveyed following a vegetarian diet, and 1% following a vegan diet[1]. Due to the avoidance of animal products there can be significant differences in nutrient intakes between meat-eaters and vegetarians, and especially vegans[2]. Importantly, research has identified that both vegans and vegetarians may be vulnerable to low intakes of some micronutrients, including vitamin B12, vitamin D, calcium, iron and zinc[3].

The aim of this study was to investigate micronutrient intake in omnivorous, vegetarian and vegan adult females. In total, 27 participants (mean age 35.1 ± 15.5 y) completed 4-day diet diaries, with 8 self-identifying as vegetarian, 4 as vegan, and 15 as omnivores. Diet intake data was inputted into Nutritics nutrition analysis software (version 4.315 Education). Differences between the groups were analysed using ANOVA with subsequent post-hoc analysis (Bonferroni Correction). Statistical software used was SPSS (version 24, Chicago, IL, USA) and the level of significance was set at $p < 0.05$.

Micronutrient	RNI	Omnivorous	SD	Vegetarian	SD	Vegan	SD
Vitamin D (µg)	10	3.7	1.6	2.9	1.3	1.4*	1.3
Vitamin B12 (µg)	1.5	4.9	2.3	2.8	1.5	1.2*	0.9
Folate (µg)	200	229.0	84.4	277.5	152.8	297.3	156.3
Calcium (mg)	700	847.3	334.6	747.1	261.5	653.5	199.8
Iron (mg)	14.8	11.4	3.2	11.5	6.8	14.0	3.8
Iodine (µg)	150	115.4	60.3	101.4	47.2	15.9*	8.28
Selenium (µg)	60	60.0	23.8	43.7	19.8	31.5	13.2
Zinc (mg)	7	9.0	2.5	7.7	2.8	7.8	2.1

*indicates mean value significantly different compared to Omnivore and Vegetarian ($p < 0.05$).

Interestingly all groups had intakes of vitamin D, iodine and iron that were below the current RNI of 10µg/day, with vegan intake of both vitamin D and iodine significantly lower than both vegetarian and omnivores ($p < .05$). The vegetarian group had a mean selenium intake below RNI, with the vegan group below the LRNI of 40 µg/day. In addition, the vegan group had significantly lower intakes of vitamin B12 compared to vegetarians and omnivores ($p < .05$). Intake of calcium, folate, iron and zinc showed no significant differences between the groups, but the mean intake of calcium was below the RNI in the vegan group.

These results suggest that adult females in the north-west of England are at risk of low intakes of Vitamin D, iron and iodine when compared to the RNI. In addition, the exclusion of animal products indicates lower intakes of selenium and iodine. Both iodine and selenium are essential for human health and play important roles in thyroid hormone production and iodine deficiency may be of particular concern for adult females of childbearing age[4]. This study agrees with current research that indicates iodine to be a public health concern and further investigation of selenium and iodine in vegans may be warranted.

1. Vegan Society Poll [Internet]. Ipsos MORI. 2016 [cited 21 January 2018]. Available from: https://www.ipsos.com/ipsos-mori/en-uk/vegan-society-poll.
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3. Craig WJ. *Nutr Clin Prac* 2010;**25**(6):613–620.
4. Bath S, Walter A, Taylor A *et al. J. Human Nutr. Diet*. 2008;**21**(4):379–380.