

Associations between tree nut consumption and diet quality in the UK adult population based on National Diet and Nutrition Survey (NDNS) rolling programme 2008–2014

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Tree nut consumption has been reported to be associated with better diet quality according to evidence from the National Health and Nutrition Examination Survey (NHANES) in the US adult population⁽¹⁾. Our study provides complementary information for the UK adult population using data from the UK National Diet and Nutrition Survey (NDNS) rolling programme (2008–2014)⁽²⁾. The aim was to investigate associations between tree nut consumption and overall diet quality in adults.

Cross sectional analysis was carried out using data from the NDNS rolling programme (2008–2014), including data from 3,371 individuals aged ≥ 19 y who completed a 4-d estimated food diary. Tree nut consumption was defined as: 1) nut snacks only, 2) total consumption including composite dishes. To estimate diet quality, two different approaches were used: 1) a data-driven approach with principle component analysis (PCA) using 59 food items, 2) a hypothesis-driven approach with 3 existing diet quality scores (Mediterranean Diet Score (MDS; potential score range 0–9)⁽³⁾, modified Healthy Diet Score (modified HDS; potential score range 0–14)⁽⁴⁾ and Eating Choices Index (ECI; potential score range 4–20)⁽⁵⁾. Multivariate linear regression models were used to investigate associations between tree nut consumption and diet quality taking into account covariates for age, sex, ethnicity, socioeconomic status, smoking status, alcohol intake and energy intake.

In the data-driven approach, PCA identified 3 dietary patterns for tree nut snack consumers and 4 patterns for non-consumers, as well as 5 dietary patterns for tree nut consumption including composite dishes and 6 patterns for composite dish non-consumers. The table presents the associated food items included in the primary dietary patterns for tree nut snack consumption (Component 1 contributing the highest percentage of variation explained).

	Tree nut snack consumers, n = 416	Tree nut snack non-consumers, n = 2955
Component 1	+ Fruit + Other potatoes, potato salad and dishes + Tea, coffee and water + Vegetables not raw + Buns, cakes, pastries and fruit pies + Yogurt, fromage frais and dairy dessert + Salad and other raw vegetables + High fibre breakfast cereals + Cheese (4.3% of variation explained)	+ White bread + Soft drinks not low calorie – Fruit + Chips, fried and roast potatoes and potato products + Crisps and savoury snacks – High fibre breakfast cereals – Wholemeal bread – Oily fish – Tea, coffee and water + Burgers and kebabs + Coated, chicken and turkey – Yogurt, fromage frais and dairy dessert (5.0% of variation explained)

Included items had factor loadings >0.3 . + shows a positive association, – shows a negative association.

For the hypothesis-driven approach, tree nut consumption, both as snack and in composite dishes, significantly predicted diet quality using all 3 scores: MDS, modified HDS and ECI ($p \leq 0.001$). For every gram increase in tree nuts included in composite dish consumption per 1000 kcal of adult's total energy intake, MDS significantly increased 0.331 ($p < 0.001$). However, tree nut snack consumption alone did not statistically change the diet quality scores for every gram of the consumption per 1000 kcal of total energy intake. Consumption of tree nuts was associated with dietary patterns including lower processed foods and refined carbohydrates as well as higher fruit and dietary fibre intakes. Tree nut consumption including composite dishes was associated with better diet quality indicated by the MDS.

- O'Neil C, Nicklas T, Fulgoni V (2015) *Nutrients* 7, 595–607.
- National Diet and Nutrition Survey. (2008/2009–2013/14). Sep 2016. Public Health England/UK Food Standards Agency.
- Trichopoulou A, Bamia C, Lagiou P *et al.* (2010) *Am J Clin Nutr* 92(3), 620–625.
- Maynard M, Ness AR, Abraham L *et al.* (2005) *Public Health Nutr* 8, 321–326.
- Pot GK, Richards M, Prynne CJ *et al.* (2014) *Public Health Nutr* 17(12), 2660–2666.