

Dietary intake of plant proteins as a marker of diet quality in french adults

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Whilst consumer demand for animal-based foods is rapidly increasing, the environmental sustainability of a diet containing high levels of animal protein has been questioned⁽¹⁾. Up until now there has been a dearth of research investigating the impact of plant and animal proteins on human health⁽²⁾ and no study has reported associations between nutrient adequacy and total plant and/or animal protein intakes. Thus the objective of this analysis was to investigate the relationship between source of protein and diet quality.

Using data from 1912 adults who participated in the French national dietary survey (INCA2, 2006–2007), we assessed diet quality using the PANDiet⁽³⁾, a unique score combining 35 probabilities of having an adequate nutrient intake, and used multiple regression analysis to study the relationship with the PANDiet score and intakes of plant, animal, and related food source proteins. Additional analyses were performed using PLS regression to assess the role of the intakes of other nutrients in these associations.

After adjustments, plant protein intake was positively associated with the PANDiet, irrespective of sex ($\beta=0.50$; $P<0.0001$). By contrast, animal protein intake was differently associated with the PANDiet according to sex, being associated positively in women ($\beta=0.08$; $P<0.0001$) and negatively in men ($\beta=-0.05$; $P<0.01$). The relationships between the PANDiet and intakes of protein from animal food sources much varied, as shown in Table 1. The PLS regression showed that virtually all nutrient intakes made important contributions to explaining the PANDiet and its relationship with protein intake (data not shown).

Table 1. Values are regression coefficients (95% CI). All types of protein intakes were energy-adjusted using the residual method. Models were adjusted for protein intake from sources other than that under study, total energy, age, season, educational level, socio-professional category of the head of the family and alcohol intake. NS, Not significant ($P \geq 0.05$).

	Men		Women	
	β (95% CI)	P	β (95% CI)	P
Red meat, <i>g/d</i>	-0.05 (-0.08, -0.02)	<0.01	0.00 (-0.04, 0.04)	NS
Poultry, <i>g/d</i>	-0.04 (-0.08, -0.01)	<0.05	0.04 (-0.01, 0.09)	NS
Processed meat, <i>g/d</i>	-0.24 (-0.31, -0.16)	<0.0001	-0.20 (-0.28, -0.11)	<0.0001
Fish, <i>g/d</i>	0.14 (0.04, 0.23)	<0.01	0.09 (0.02, 0.17)	<0.05
Milk, <i>g/d</i>	0.15 (0.04, 0.26)	<0.01	0.40 (0.30, 0.50)	<0.0001
Yoghurt, <i>g/d</i>	0.25 (0.13, 0.37)	<0.0001	0.64 (0.52, 0.75)	<0.0001
Cheese, <i>g/d</i>	-0.16 (-0.21, -0.10)	<0.0001	-0.08 (-0.16, -0.00)	<0.05
Eggs, <i>g/d</i>	-0.33 (-0.52, -0.13)	<0.01	-0.59 (-0.79, -0.39)	<0.0001

These findings imply that plant protein is a robust marker of a healthier diet in French adults, whereas the relationship between animal protein and diet quality is much heterogeneous.

1. Boer J, Helms M, Aiking H (2006) *Ecological Economics* 59, 267–74.
2. USDA & USDHHS (2010) Dietary guidelines for Americans, Part D, Section 4.
3. Verger EO, Mariotti F, Holmes BA, et al. (2012) *PLoS One* 7, e42155.