

Letter to the Editor

Characteristics and nutrient intake of Taiwanese elderly vegetarians: evidence from a national survey

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The recent study published in the *British Journal of Nutrition* by Huang *et al.*⁽¹⁾ has several design flaws that may have contributed to the null finding that vegetarian and omnivore elderly in Taiwan do not differ significantly in hypertension and the metabolic syndrome.

First, an obvious problem lies in the misclassification of the vegetarian group. Of the 269 'vegetarian' respondents, only forty-one (15%) were 'complete vegetarians', while the majority (85%) were eating meat as a component of up to two-thirds of their meals. The classification of the 'vegetarians' into 'lacto-ovo' and 'vegan' may further create confusion. The term 'vegan' typically applies to individuals who eliminate not only meat but also all other animal products such as dairy products and eggs⁽²⁾. Since only forty-one respondents were reported to be 'complete vegetarians', it could be assumed that at least 50% of the eighty-three respondents in the vegan group were eating an average of one to two meat-containing meals per d. The grouping of these omnivores into the 'vegan group' has totally violated the definition of 'vegan' and made the study results incomparable with other studies of vegetarians and vegans. The nutrient analyses of the 24 h recall further showed surprising results not typically expected of a vegetarian diet: by definition, a vegan diet should not contain cholesterol, but the 'vegans' in the study actually had a median cholesterol intake of 121.9 mg/d. In addition, vegetarians did not differ significantly from omnivores in SFA consumption. These results indicate that the vegetarians in the study may actually be consuming a substantial amount of meat or other animal products. By comparing one group of omnivores with another group that is mostly (85%) omnivores, it is not a surprise that the authors obtained a null result. Researchers should be cautious that the so-called 'breakfast vegetarians' in Taiwan may be eating substantial amounts of meat in other meals and should therefore not be regarded as true vegetarians. On the other hand, many Taiwanese people who self-identify as omnivores may actually be eating a vegetarian breakfast consisting of fresh soya milk, rice milk, bread and Chinese buns.

Another limitation that the authors did not address is the possibility of reverse causation. Since a vegetarian dietary pattern is typically perceived as beneficial for health, it is possible that elderly subjects already with the metabolic syndrome shift towards a plant-based dietary pattern in an attempt to improve their health condition. The study indeed indicated that those

in the vegetarian group were also more likely to have habitual physical activities, a sign for healthy-lifestyle-seeking behaviours. Without controlling for reverse causation, it is difficult to learn the real association between vegetarian diets and the metabolic syndrome.

We think that both the misclassification and the potential reverse causation have biased the results towards the null. Another study, with more accurate categorisation of study participants into vegetarian groups, has shown that vegetarian dietary patterns are associated with a lower risk of the metabolic syndrome⁽³⁾.

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