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THE DIETARY PATTERN BEHIND VARIATIONS IN PLASMA BCAA-CONCENTRATIONS IN HEALTHY MEN AND WOMEN – RESULTS FROM THE KARMEN STUDY

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High plasma concentrations of the essential branched-chain amino acids (BCAA) isoleucine, leucine and valine are discussed as risk factors for the onset of several diseases. Information about the contribution of the overall diet to plasma BCAA concentrations is controversial. Our objective was to investigate which dietary pattern is associated with plasma BCAA concentrations and whether further nutrients besides BCAA, such as other amino acids, may contribute to disease risk.

Based on the cross-sectional KarMeN (Karlsruhe Metabolomics and Nutrition) study, fasting plasma amino acid concentrations, as well as current and habitual dietary intake were assessed in 298 apparently healthy individuals, 171 men (57.4%) and 127 women (42.6%) with a mean age of 44.5 and 51.6 years, respectively. All reported foods were summarized into 35 food groups. We used reduced rank regression to derive dietary patterns that explain as much variation as possible in plasma BCAA concentrations. For further analysis, we focused on the first derived habitual dietary pattern which explained 32.5% of plasma BCAA variation. This pattern was high in meat, sausages, sauces, eggs, and ice cream but low in nuts, cereals, mushrooms, and pulses. The age, sex, and energy intake adjusted dietary pattern score was associated with an increase in animal-based protein together with a decrease in plant-based protein, dietary fiber and an unfavorable fatty acid composition. Besides BCAA, alanine, lysine and the aromatic amino acids phenylalanine, tyrosine, and tryptophan were positively associated with the dietary pattern score as well. All of these factors were reported to be associated with risk of type 2 diabetes and cardiovascular diseases before.

Our data suggest that the overall dietary pattern contributing to high BCAA plasma concentrations may modulate chronic diseases risk, rather than the dietary intake of BCAA.



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