Practice abstract #4.2

DIAAS and contribution to RDI: optimization criteria for plant-based protein mixtures

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KEY WORDS
Plant-based proteins, nutritional quality, DIAAS, RDI

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CHALLENGE

There is a trend to increase plant-based proteins consumption and related nutritional quality concerns. FAO recommended using the Digestible Indispensable Amino Acid Score (DIAAS) to evaluate the nutritional quality of protein sources, also for mixtures. Highest DIAAS can be used as an optimization criterion for plant-based mixtures, but it ignores their contribution to the recommended daily intake (RDI) of IAAs.

SOLUTION

An additional optimization criterion: the highest relative contribution to the RDI of the limiting IAA. We impose the restriction of a DIAAS value above 75 (protein quality claim applicable). The RDI was set up for adults (60 kg bw) and for a daily intake of 100 g dm.
The composition and quality of proteins of oat (O), triticale (T), barley (B), buckwheat (BW) and lupine (L) flours and fava bean

protein concentrate (FB) were averaged from literature. DIAAS were calculated according to the reference pattern score of 0.5-3 year-old population group (FAO).

OUTCOME

The optimal two-ingredient mixture for highest DIAAS was BW:FB [0.83:0.17] (DIAAS=88 and RDI=53%; LimIAA=Valine), whereas for highest RDI was O:FB [0.73:0.27] (DIAAS=75 and RDI=61%; LimIAA=SIAA).
The optimal multi-ingredient mixture for highest DIAAS was BW:FB:O [0.63:0.15:0.22] (DIAAS=89 and RDI=51%; LimIAA=Valine), whereas for highest RDI was O:FB:BW:L [0.14:0.19:0.48:0.19] (DIAAS=75 and RDI=66%, LimIAA=SIAA).

PRACTICAL RECOMMENDATIONS

The optimization criterion for highest RDI (including a minimum DIAAS restriction, if quality claim is pursued) is more adequate to meet the physiological requirements with minimal intake.

About CROPDIVA

CROPDIVA wants to put 6 underused arable crops back in the fields: oats, hull-less barley for human consumption, triticale, buckwheat, faba beans and lupins. 27 European partners are joining forces to enhance agrobiodiversity in Europe. They will achieve this by focusing on crop diversity and creating local value chains. The project is running from September 2021 to August 2025.

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement N°1010000847