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Improving protein quality of an oat-based drink



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CHALLENGE

Plant-based milk analogs have been attracted interest from consumers, mainly those belonging to the groups allergic to cow's milk protein and lactose intolerant, or also those people who are vegetarian and vegan. In this context, the oat-based drink is widely consumed. However, the protein quality of oat is much lower than the cow's milk considering the amino acids profile recommended by FAO. The estimated Digestible Indispensable Amino Acid Score (DIAAS) of cow's milk and oat-based drink are 130% and 65%, respectively.

SOLUTION

The protein quality of oat-based drink can be improved by mixing it with other sources of plant proteins, which apports the limiting amino acids of oat protein. Three improved oat-based drinks were prepared:

1. Oat-based drink + Faba bean protein isolate (47% of protein coming from faba).
2. (Oat + Lupin)-based drink (79% of protein coming from lupin).
3. (Oat + Buckwheat)-based drink + Faba bean protein isolate (22% and 49% of protein coming from buckwheat and faba respectively).

The liquefaction process of the last two improved drinks had to be adapted to be suitable for a mixture of flours from different sources.

OUTCOME

The supplementation of an oat-based drink with faba bean protein isolate (PI) improved the estimated protein quality (DIAAS=95%) and had a slight faba bean flavor that was not unpleasant.



(Oat-Lupin) drink was obtained from a mixture of oat and lupin flours. It had a characteristic lupin flavor. However, the estimated protein quality was hardly improved (DIAAS=76%).

(Oat-Buckwheat) drink was obtained from a mixture of oat and buckwheat flours, and it was supplemented with faba bean

protein isolate. It showed the highest estimated protein quality (DIAAS=103%). It had a characteristic flavor, dominating the buckwheat flavor.



Oat + Lupin

Oat + Buckwheat + Faba PI

PRACTICAL RECOMMENDATIONS

To improve the protein quality of oat-based drink, oat flour can be mixed with lupin and specially with buckwheat flour, however they impair characteristic flavors to the drink, which should be tested if they are accepted by consumers.

If a dominating oat flavor is desired, the oat-based drink can be supplemented with faba bean protein isolate.

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.



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