Revalorization of hemp food by-products to contribute towards meeting nutritional requirements and sustainable diets

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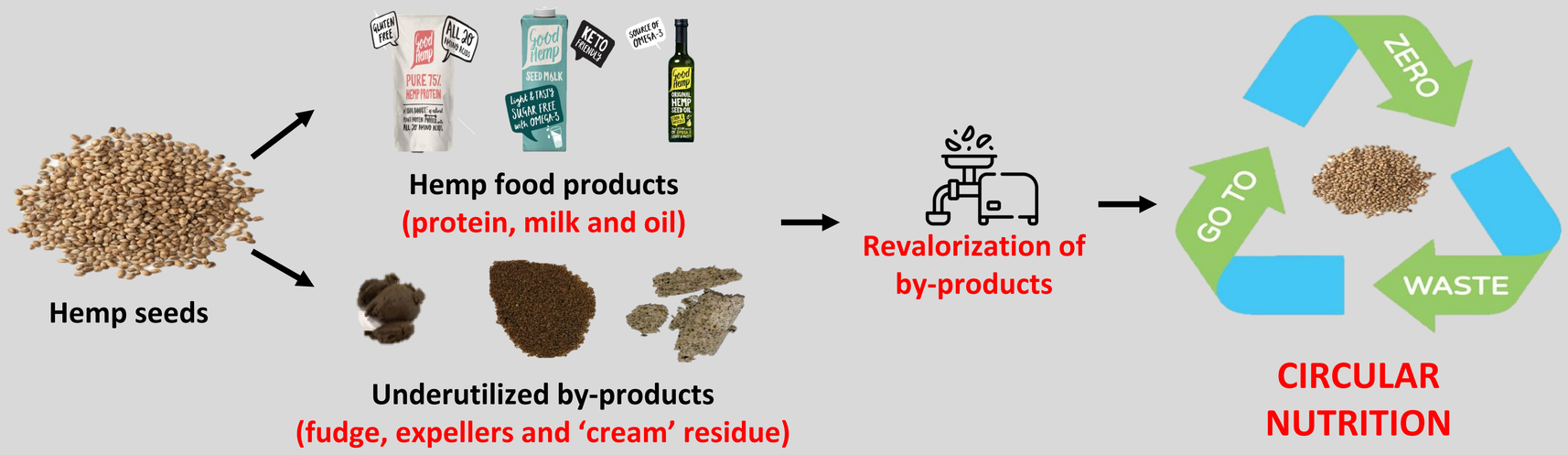
Introduction

Future food systems will face unique challenges to deliver an increased requirement for nutritious and good quality foods for a continuously growing population (1).

Hemp is an underutilised sustainable food crop in the human diet, which can be processed to produce food products (flour, milk, and oil) generating several by-products (2).



Aims

- To determine the nutrient and chemical composition of hempseed foods and by-products.
- To assess the suitability of hempseed foods and by-products to meet the daily recommendation intake of macronutrients and micronutrients in human diet.

Methodology

Protein was measured as total nitrogen using the Dumas combustion method (1). Non-starch polysaccharides (NSP) were determined by the Englyst method (1). ICP-MS was used to analyze micronutrients (1).Fatty acids were quantified by GC-MS (3).

Results

Hempseed foods and by-products are rich sources of protein (>20%), except the hemp seed-hull flour (12.43%). For example, 100 g hemp protein product (85%) delivers all the daily protein requirements and 100 g of cream solid residue around 70% of the daily requirements (Figure 1).

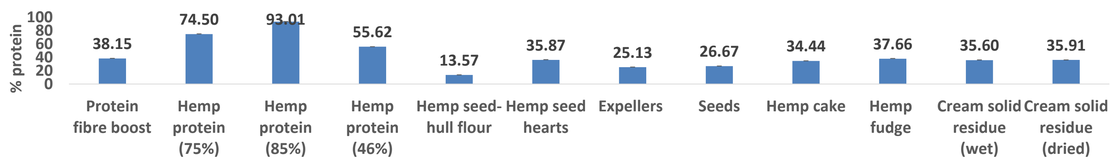


Figure 1. Hempseed foods and by-products protein content in g/100g as mean (n=3 ± STD).

Hempseed foods and by-products are rich sources of healthy fats (omega fatty acids); meeting the recommended ratio of 1/1- 4/1 for omega-6/omega-3 fatty acids (Figure 2).

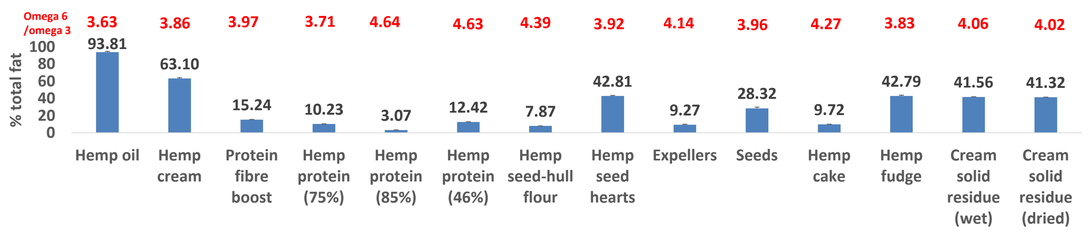


Figure 2. Hempseed foods and by-products fat content in g/100g as mean (n=3 ± STD) and fatty acids ratios.

The total non-starch polysaccharide (NSP) content varied from 3.68% in hemp seed hearts to 39.90% in hemp seed-hull flour (Figure 3), representing an important source of dietary fibre, to meet daily recommendations of 30g/day.

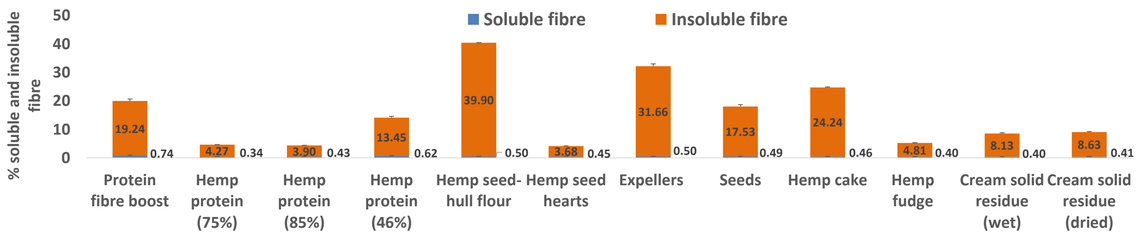


Figure 3. Soluble and insoluble fibre (NSP) content in g/100g as mean (n=3 ± STD)

Moreover, the hempseed foods and their by-products could deliver the recommended nutrient intake (RNI) for several elements such as manganese, iron, magnesium, and phosphorus (Figure 4).

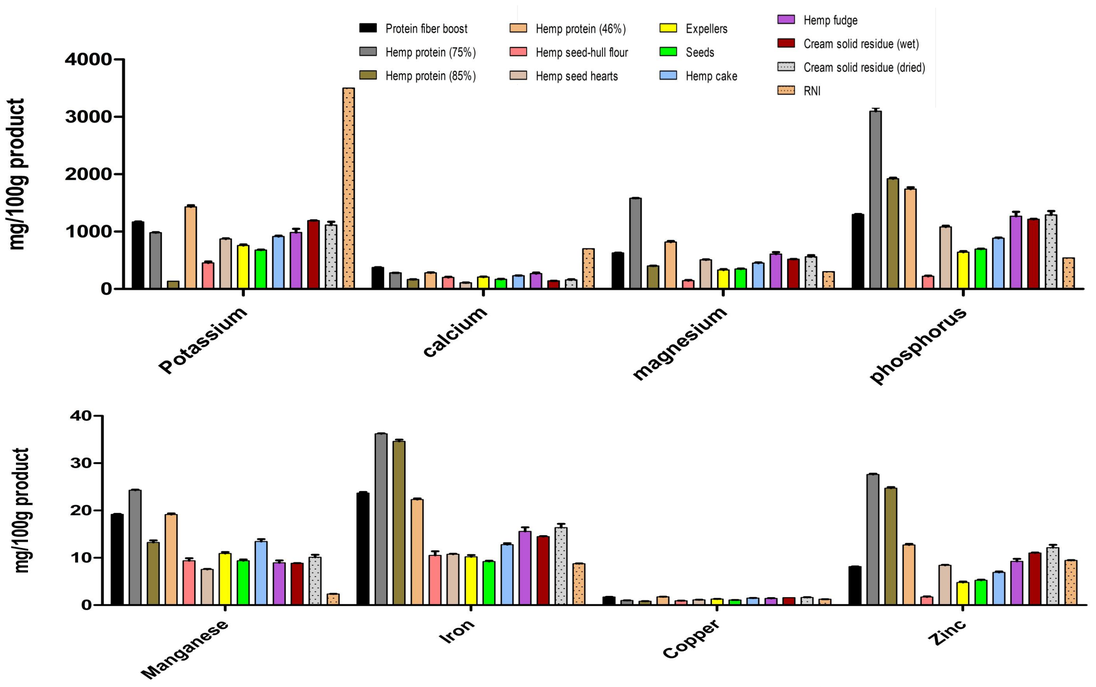


Figure 4 . Hemp seed foods and by-products microelement content expressed as mg/100 g dry weight ± STD (n = 3) .

Conclusions

- **Hempseed foods and their by-products are rich sources of dietary protein, fibre, fatty acids (omega-6/omega-3), and microelements contributing to meet the daily recommended nutrient intakes.**
- **The hempseed based foods represent sustainable choices to bio-diversify the dietary macronutrients.**

Acknowledgement

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References

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