CHEMICAL PROPERTIES AND NUTRITIONAL FACTORS OF 5 DIFFERENT PRESSED-CAKES

The objective of this study was to determine the chemical composition and nutritional quality of pressed-cakes obtained from golden linseed, sunflower seed, hazelnuts, pumpkin seeds and hemp seeds. The information obtained will be useful for further value added possibilities of this by-product.

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Introduction

Oilseed cake is a by-product of oil making, where the seeds are mechanically pressed in a process called "cold pressing". The obtained pressed-cake still contains some valuable bioactive compounds such as free fatty acids, glycerides (mono- and diglycerides) as well as protein fragments. These industrial by-products are currently used in the feed industry, but in some places they have already started to be used in the food industry as well.

MATERIALS AND METHODS

- Samples (pressed cakes, oils):
  - golden linseed
  - hazelnuts
  - pumpkin seed
  - hemp seed
  - sunflower seeds
- Determination of fat content by extraction method (Soxhlet)
- Fatty acid composition measurement by gas chromatography (ISO12966-3:2016 and ISO12966- 4:2015)
- The amino acid composition were determined by Ingos 400 Automata Amino acid Analyser
- The total protein content measured by Kjeldahl method (ISO 8968)
- PDCAAS and DRV% were calculated based on the in vitro digestibility values (D%) and the protein quality

Fig.1: sunflower seed pressed cakes

Results

- The pumpkin seed has the highest protein content and a favorable amount of essential amino acid profile.
- The pumpkin- and sunflower seeds were the ones that approximated the value of most of the essential amino acids (EAA), in order to adequately meet the protein needs.
- The PDCAAS values of sunflower seed (0.25) and flaxseed (0.23) were the highest, although these can also be considered lower digestibility, but this can be improved with additional processing steps during use in food production.
- The DRV% results showed that the sunflower seed do not have the highest amino acid composition and DRV value.
- Sunflower and hazelnut fat content had the highest (54%) and linseed has the lowest (20%). The saturated fatty acid (SFA) content of the examined samples is negligible in addition to the amount of monounsaturated and polyunsaturated (PUFA, MUFA), which is an important aspect for health preservation and promotion.

Conclusion

- In case of the essential amino acid profile we can eliminate the limiting amino acids (lysine, isoleucine) by mixing the raw materials differently.
- The pumpkin- and sunflower seeds were the ones that approximated the value of most of the essential amino acids, in order to adequately meet the protein needs.
- The information obtained will be useful for further value added possibilities of this by-product and suggest that the pressed-cake could be a useful ingredient for human consumption and could be used for food fortification.

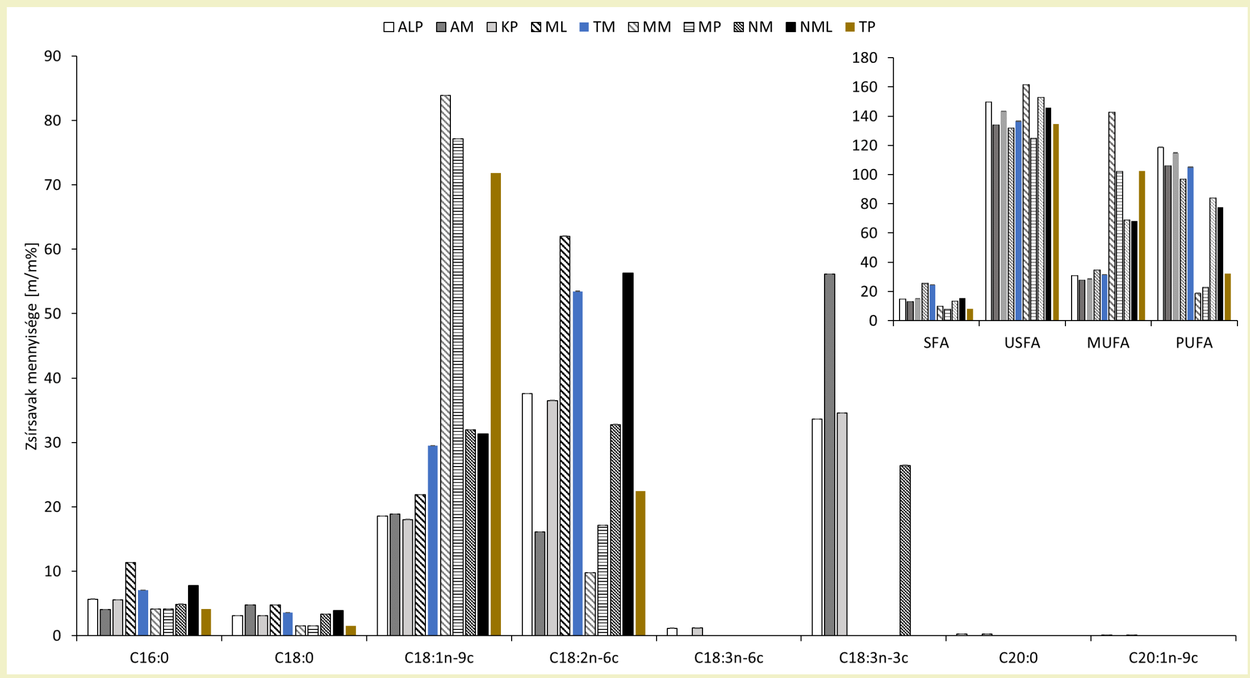

Table 1: fatty acid profile of samples obtained from oilseeds and press cakes

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