Utilization of Tofu By-products as an Alternative Source of Bioactive Peptide Lunasin

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Introduction:
Soybeans contain a low molecular weight (5kDa) bioactive peptide called lunasin, which possesses chemotherapeutic, anti-inflammatory, and anticarcinogenic properties (1). Current strategies for obtaining lunasin are too complicated and expensive to be widely utilized. Soybeans can be processed to make tofu, yielding whey and okara as major by-products (2). However, the potential for these by-products as a possible source of lunasin remains unexplored. Therefore, the aim of this study was to establish if tofu by-products can be easily utilized as sources of lunasin enriched material.

Methods:
Tofu was prepared from soybeans by a standardized procedure, and calcium was used to induce preferential precipitation of lunasin present in the whey. Precipitate and supernatant fractions obtained were characterized by measuring protein profile (Electrophoresis), total soluble protein content (Bradford assay), lunasin content (Western blot) (3), and presence of isoflavones (HPLC).

Results:

Discussion and future work:
Addition of calcium to the whey promoted precipitation of small proteins, producing a liquid fraction with a wide distribution of proteins, and a solid fraction containing low molecular weight proteins (<15kDa). The lower content of soluble proteins and higher content of lunasin of WL and WS, compared to DSF, suggest the successful concentration of the bioactive peptide, while maintaining a negligible amount of isoflavones. Treatment and characterization of okara as a possible source of lunasin enriched material will be our next step.

Conclusion:
Our results indicate that tofu whey can be used as an alternative source of lunasin enriched material via calcium precipitation.

References: