Preparation of bioactive peptides from poultry by-products

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Summary

Poultry wastes could be turned into value-added bioactive peptides following a procedure involving the release of small peptides from large proteins.

Background

- According to Agriculture and Agri-Food Canada ~600 million chickens and 20 millions turkeys were slaughtered in Canada in 2012. Meanwhile, in Alberta, about 1.6 million of spent hens are disposed each year, which makes a significant supply of spent fowl.
- Some poultry wastes can be further processed as pet food, while other wastes (such as turkey feet, cartilage and crushed bones from mechanical deboners) have limited utilization.
- These waste materials are a potential source of valuable bioactive peptides with nutritional and pharmaceutical applications such as anti-inflammatory, antioxidant, and ACE inhibitory functions.
- Poultry meat contains over 70% proteins (dry weight based); on the other hand, the skin, tendon, cartilage are rich sources of collagen.

The goal

Preparation of low molecular weight peptides (best for bioactivity) from various poultry sources in a cost effective way.

Our approach

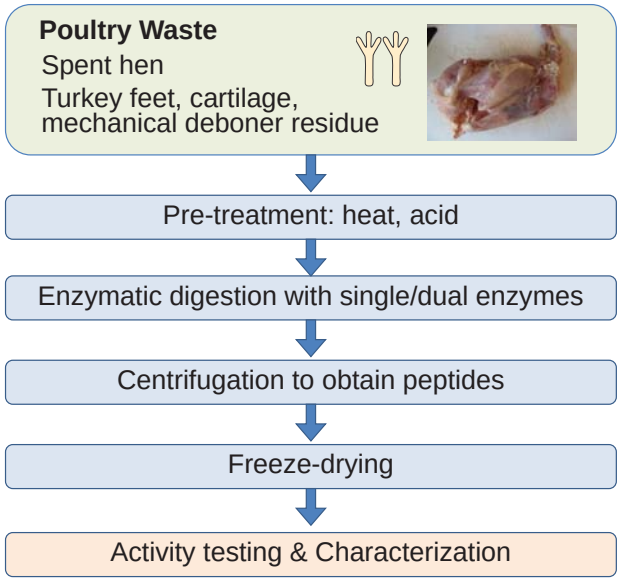

Figure 1. Procedure used for preparation of bioactive peptides from various poultry wastes

Our Observations

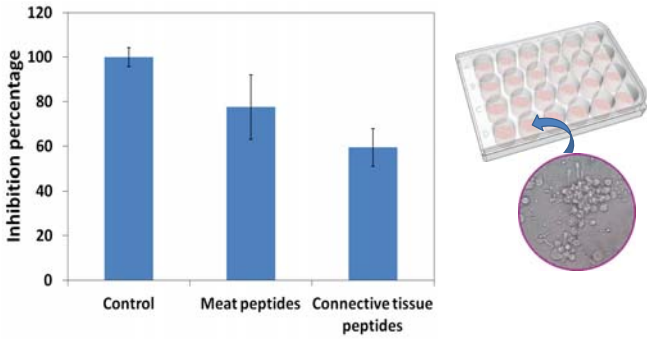

Figure 2. Anti-inflammatory activity of spent hen peptides (left) tested in activated human monocytic cell line (right).

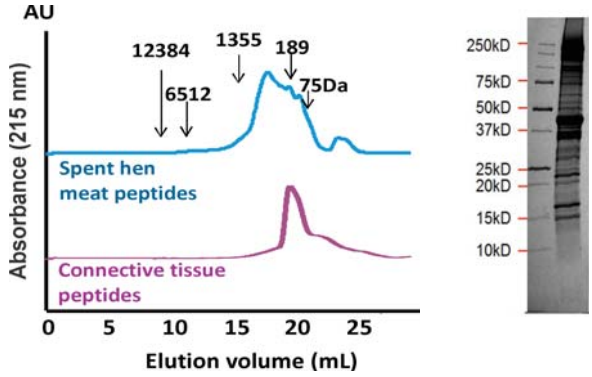

Figure 3. Size of spent hen proteins before treatment (right) and size of the peptides after treatment (left).

What Does this mean?

- A significant reduction in molecular weight (MW) was observed in treated samples which implicates an efficient release of small peptides from large protein molecules following this procedure.
- This reduction in MW was later found to be beneficial as evident by the positive results from bioactivity studies.
- Peptides with bioactivities such as immunomodulatory, antioxidant and ACE inhibitory could be developed as ingredients for functional foods which provides physiological benefits beyond basic nutritional functions.

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