METHOD FOR PRODUCING HIGH BLOOM GELATIN FROM PLURALITY OF POULTRY BY-PRODUCTS

1. Poultry by products (head/feet)
2. Mincer
3. Minced poultry head
4. Extraction & gelatin recovery
5. Gelatin slurry
6. Drying & Grinding

Background
- Commercial gelatins are from bovine and porcine hide and bones.
- Alternative gelatin from non-mammalian especially fish species are still very limited.
- Religious practices and safety issues.
- Increase in demand of the global gelatin market (Transparency market research, 2014).
- Need to find alternative sustainable source of gelatin which should be functionally equal or superior.
- The existing methods of gelatin extraction are:
  - time consuming
  - use huge quantity of chemicals
  - the gelatin varies in grade

Why poultry gelatin?
- Revenue generating activity
- Commercially viable – abundant supply
- The consumption of poultry increase worldwide (4.3% annual growth) with 78 million ton of poultry meat production (FAO, 2012).
- Malaysia has a strong poultry processing industry.
- Recycling of wastes (~28-32%) are poultry by-products.

Invention
- A simple, feasible, cost and time effective method of gelatin extraction
- within short process with minimum chemicals
- at mainly room temperatures
- from poultry by-products (head, feet, & bone)
- the poultry animals includes chickens, turkeys, geese, ducks, guinea fowls and quails.
- The gelatin extracted from the present method is of superior grade
  - high bloom strength (360 g)
  - high protein content (83.5-91.2%)
  - good functionality and physical appearance (whitish color)

Table 1: Characteristics of extracted chicken head gelatin in comparison with bovine gelatin

<table>
<thead>
<tr>
<th>Gelatin source</th>
<th>Gel Bloom (g)</th>
<th>Protein (%)</th>
<th>Ash (%)</th>
<th>Color (L*)</th>
<th>Amino Acid (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken head gelatin</td>
<td>363.67</td>
<td>91.23</td>
<td>0.17</td>
<td>85.16</td>
<td>12.12</td>
</tr>
<tr>
<td>Bovine skin gelatin</td>
<td>190.64</td>
<td>83.98</td>
<td>0.98</td>
<td>75.85</td>
<td>-</td>
</tr>
</tbody>
</table>

Usefulness/application
- Alternative choice of halal gelatin.
- Suitable for use in:
  - Food industries – for confectionery and related functional properties such as gelling, emulsifying agents and encapsulation for the food and beverage industry.
  - Pharmaceutical - for the manufacturing of soft and hard shell gelatin capsules, plasma substitute, scaffolding in wound healing and binder in tablet formulations.
  - Neutraceutical - as an ingredient for cosmetic products and as an excipient agent and excellent source of amino acids for the manufacturing of antioxidant/anti-inflammatory supplements.

Project Leader: Prof. Dr. Jamilah Bakar
Co-Researchers: Ee Shu Chee, Prof. Dr. Nazamid Saari, Prof. Dr. Amin Ismail, Assoc. Prof. Dr. Faridah Abbas
Faculty: Faculty of Food Science & Technology
Email: jamilah@upm.edu.my
Tel: 03-8946 8396
Expertise: Food Technology, Seafood Technology

www.upmioid.my