Avian Eggshell Membrane Collagen
Types I.V.X™

U.S. Patent # 8,344,106B1
CHARACTERISTICS

- Extracted from Avian (chicken) eggshell membrane.
- Improved process of extraction.
- Advanced exclusive proprietary technology free of chemicals.
- Contains incredible antimicrobial and anti-inflammatory nutrients.
- Certified to contain (Min 22% Collagen Type I.V.X.)
- Naturally contains: (Min 2% Mucopolysaccharide, .01% Chondroitin, & .05% Hyaluronic acid)

**kollaGen I.V.X™** is a safe oral, and total supplement available in powder and liquid concentrate; “Fit for human consumption”

- Partial cold water soluble.
- Of USA Origin.
MANUFACTURING

- Our advantage utilizes a proprietary chemical free technology using *water extraction process* in manufacturing to maintain the integrity of its delicate molecules.

- This unique process preserves the important natural compounds such as the antimicrobial, anti-inflammatory, and hyaluronic acid nutrients.

- We do **NOT** use any solvent (ethanol) or harsh chemicals.

SQF Code Edition 7.2
Level 2: Certified HACCP Based Food Safety Plans
PRODUCT ANALYSIS

- Avian eggshell membrane collagen types I.V.X. powder.
- Raw material from chicken eggshell membrane
- Food fit for human consumption.
- Mesh size 100% passes through a 20% mesh sieve
- Total protein Min 22% (collagen type I.V.X.)
- Off white/tan appearance fine powder.
- Neutral odor.
- Partial water soluble.
# AMINO ACID PROFILE

**TYPICAL AMINO ACID PROFILE** (mg/ml) of protein powder*

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Specification NMT</th>
<th>Results %</th>
<th>Method</th>
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<tbody>
<tr>
<td>Alanine</td>
<td>9.0</td>
<td>5.82</td>
<td>AOAC 994.12 (Alt III)</td>
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<tr>
<td>Arginine</td>
<td>12.0</td>
<td>7.88</td>
<td>AOAC 994.12 (Alt III)</td>
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<tr>
<td>Aspartic acid</td>
<td>18.0</td>
<td>11.83</td>
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<tr>
<td>Cystine</td>
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<td>1.06</td>
<td>AOAC 994.12 (Alt I)</td>
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<tr>
<td>Histidine</td>
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<td>5.67</td>
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<tr>
<td>Glutamic Acid</td>
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<td>13.9</td>
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<td>Glycine</td>
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<tr>
<td>Isoleucine</td>
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<td>4.3</td>
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<td>Leucine</td>
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<td>Lysine</td>
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<tr>
<td>Methionine</td>
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<td>Phenylalanine</td>
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<td>Threonine</td>
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<td>Tyrosine</td>
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<td>Valine</td>
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<td>9.02</td>
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* MAY NATURALLY VARY

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RECOMMENDED DOSAGE

For human consumption: Take 500mg twice a day with a glass of orange juice, vitamin C drink, (vitamin C plays a role in the production of collagen) or water on an empty stomach. Wait 30 minutes before eating.
APPLICATIONS

- Supports skin health, wound healing, and connective tissue disorders
- Collagen used as a skin revitalizer: creams, skin care, pharmaceutical applications, and nutraceuticals.
- Supports cartilage synthesis, decreases the chance of joint deterioration, health function and flexibility.
- Provides valuable macro-minerals, antimicrobial, and anti-inflammatory compounds.
- Suitable for capsules, tablets, beverages, skin care and cosmetics.
Collagen-like proteins have been found in the egg shell membranes of the hen. Materials similar to types I and V collagens were detected in each of the two layers of this membrane, the thick outer membrane and the thin inner membrane. Collagen was extracted by acid-pepsin digestion and isolated by differential salt precipitation. Identification of type-specific collagen-like material was established by coelectrophoresis on SDS-polyacrylamide gels using known collagen standards. These bands were susceptible to digestion by bacterial collagenase. From differential staining of the gels it was estimated that the ratio of collagen types I:V was approximately 100:1. Further confirmation of these biochemical results was obtained with immunofluorescence microscopy using type-specific antisera against chicken types I and V collagen with the indirect sandwich technique. Both the inner and outer shell membranes contained the two types of collagen. Within each membrane, the large, coarse 2.5-micron fibers contained predominantly type I collagen-like material, while type V collagen was mainly associated with the delicate narrower fibers of approximately 0.6-micron diameter. These tended to be concentrated in the inner membrane. At the electron microscopic level, both types of fibers were coated with glycoproteins that stained positively with ruthenium red. The deposition of these collagen-like substances by the hen oviduct on to the surface of the developing egg is an additional example of interstitial-type collagen synthesis and secretion by epithelial rather than by mesenchymal cells.
An immunohistochemical analysis of the eggshell membranes shows the occurrence of type X collagen while type I collagen was not detected by using an appropriate monoclonal antibody with untreated shell membranes. A positive immuno-reaction for type I collagen was obtained after digestion of the shell membranes with pepsin. These observations indicate the possibility that type I collagen epitope was masked by type X collagen and that type X collagen may serve as an inhibitory boundary for biomineralization.
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Source
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Abstract
The objectives of this study were to analyze glycosaminoglycan (GAG) and mineral composition in the chicken eggshell. Eggshells were decalcified with acetic acid, and GAG was extracted from the decalcified shell by digestion with papain. The eggshell contained an average of 0.024% of its dry weight as uronic acid, a carbohydrate moiety of GAG. The eggshell GAG consisted of approximately 48% hyaluronic acid and and 52% galactosaminoglycan. In the latter, chondroitin sulfate-dermatan sulfate copolymers were the major galactosaminoglycans with dermatan sulfate disaccharide as a relatively minor component. The inorganic material recovered after decalcification accounted for approximately 140% of dry weight of the eggshell and contained 24.11% calcium, 0.04% phosphorous, and 0.23% magnesium, with an undetectable amount of nitrogen.
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