



NORLAND PRODUCTS INC.



Hydrolyzed Fish Collagen

- **Kosher Certified**
- **Halal Certified**

***Nutraceutical – Pharma – Food
Meets USP, EP and JP Specifications***



Hydrolyzed Fish Collagen

Hydrolyzed Fish Collagen is a pure protein made up of amino acids¹. These are the basic structural group for all proteins. While all proteins are made up of amino acids, not all proteins are collagen.

Collagens from all sources are composed of the same amino acids and have the same Chemical Abstract Service² number 68410-45-7 no matter if they come from fish, cattle or pigs. The difference is the amino acids are in

slightly different percentages and the acceptance or confidence that consumers place in the source, manufacturing and purity.

Everyone needs to consume protein in order to provide the nutrition needed for daily life. If you are reducing your consumption of red meat, our Hydrolyzed Fish Collagen can readily be added to your diet to insure you obtain the necessary protein. There's no cholesterol, sugar or fat in our protein so it can be added to meals to provide a pure protein boost. When collagen is hydrolyzed, the protein molecules are broken into smaller molecules. A hydrolyzed protein will be easier to digest and will be absorbed by the body faster and easier than a non-hydrolyzed protein.

The Norland Hydrolyzed Fish Collagen (HFC) is manufactured from collagen which is the principal protein found in all animal skin and bones. While animal collagen is typically extracted from cattle or pig skin, our fish collagen is produced from the skins of wild, deep-sea, ocean fish such as cod, haddock and pollock. Wild fish have no possibility of being exposed to antibiotics or hormones as is possible with farm raised animals or fish³. In addition, only the skins of kosher fish⁴ are used, so the HFC is able to meet the strict kosher standards of the Orthodox Union. <http://www.ou.org> These same skins and manufacturing conditions also meet the stringent standards of the Halal Food Council of South East Asia. <http://halalfoodcouncil.info>

Norland HFC is manufactured in Canada by Kenney & Ross Limited, a facility dedicated to marine products. At this facility the skins from the wild, deep sea fish are collected from food fish processors in Canada, the U.S. and Europe to provide quality raw material. Prior to any extraction, the skins receive a lengthy wash with copious amounts of water. This step cleans the collagen and reduces the allergens to undetectable levels. It is only then that the collagen is ready to be hydrolyzed with a food grade acid and then further hydrolyzed with a food grade enzyme to break down the collagen's molecular weights. No genetically modified materials are used in this product or in any of our Fish Gelatins or Collagens. After filtering, purification and concentration, the HFC is sterilized and spray dried to produce the powder that you receive.



The HFC is pure protein and is very water soluble with no off odor or taste. It can be used as a concentrated protein or additive for nutraceutical, cosmetic or food applications and will exceed the purity requirements of the United States, European and Japanese Pharmacopeias for gelatin.

1. *Amino Acids are the chemical units or "building blocks" of the body that make up proteins. Protein substances make up the muscles, tendons, organs, glands, nails, and hair. Growth, repair and maintenance of all cells are dependent upon them. Next to water, protein makes up the greatest portion of our body weight. Amino Acids that must be obtained from the diet are called "Essential Amino Acids". Amino Acids that the body can manufacture from other sources are called "NonEssential Amino Acids."* www.realtime.net/anr/aminoacd.html
2. *CAS registry numbers are unique numerical identifiers for [chemical compounds](#). They are also referred to as CAS numbers or CAS RNs. The Chemical Abstract Service, a division of the [American Chemical Society](#), assigns these identifiers to every chemical that has been described in the literature. About 20 million compounds have received a CAS number so far, with about 4,000 new ones being added each day. The intention is to make database searches more convenient, as chemicals often have many names. Almost all molecule databases today allow searching by CAS number.* www.knowledgerush.com/kr/encyclopedia/CAS_number/
3. *Barrionuevo A., Chile's Antibiotics Use on Salmon Farms Dwarfs That of a Top Rivals's, NY Times, July 26, 2009* www.nytimes.com/2009/07/27/world/americas/27salmon.html?_r=1
4. *A fish that is kosher will have scales and fins such as cod, pollock and haddock. Examples of non-kosher fish are catfish, sharks, eels and rays. All the skins used to produce our collagen are from food fish processing plants in Canada, the United States and Europe*



Research and the Health Benefits^(a) of Hydrolyzed Collagen

Osteoarthritis and Osteoporosis

Many studies have been performed to determine if collagen hydrolysates help in the treatment of osteoarthritis and osteoporosis. Moskowitz¹ reviewed the status of collagen hydrolysates in 2000 and Bello² in 2006. Moskowitz concluded that, "Collagen hydrolysate is of interest as a therapeutic agent of potential utility in the treatment of osteoarthritis and osteoporosis. Its high level of safety makes it attractive as an agent for long-term use in these chronic disorders." Bello concluded, "A growing body of evidence provides a rationale for the use of collagen hydrolysate for patients with OA."



Laboratory tests indicate that the increased production of joint cartilage may be initiated by the ingestion of the hydrolyzed collagen while patient testing indicates that some of the peptide groups thought to be required to produce cartilage are absorbed by the blood³. It is not conclusive whether the cartilage growth is initiated by the presence of the hydrolyzed collagen or whether the hydrolyzed collagen provides the peptide chains for growth. It's possible that the increased production of joint cartilage is caused by one or both mechanisms.

1. Moskowitz R.W., *Role of collagen hydrolysate in bone and joint disease, Seminars Arthritis Rheum 2000: Oct; 30(2):87-99*
2. Bello A.E., *Collagen hydrolysate for the treatment of osteoarthritis and other joint disorders: a review of the literature, Current Medical Research Opinions 2006: Nov;22(11):2221-32*
3. Ohara H, *Comparison of quantity and structures of hydroxyproline-containing peptides in human blood after oral ingestion of gelatin hydrolysates from different sources, Journal Agric Food Chem, 2007 Feb 21;55(4):1532-5*

Healthy Hair, Skin and Nails

Hydrolyzed Fish Collagen contains much larger amounts of the amino acids glycine and proline than many other proteins. These amino acids are necessary for promoting healthy tissue growth of hair, skin and nails. A recommended dose of 10 grams (2 tablespoons) a day in the diet is optimum.

Recent studies in Europe and Japan have indicated the benefit of consuming 10 grams of hydrolyzed collagen to improve skin hydration and reduce the number of micro and deep wrinkles compared to a placebo¹.

1. Leong K., *Can a Collagen Supplement Help Aging Skin? May 9, 2009*
<http://www.healthmad.com/Aging/Can-a-Collagen-Supplement-Help-Aging-Skin.699651>

Protein Supplement

Since collagen is a pure protein, it has many applications as a protein supplement¹. It can be added either to diet or supplement formulas to readily increase the protein in a meal or drink to provide optimal nutritional support.

1. Castellanos VH Litchford MD, Campbell WW, *Modular Protein Supplements and Their Application for Long-Term Care, Nutrition in Clinical Practice 2006: Vol 21, No. 5, 485-504*

Easy to Digest

Our Hydrolyzed Fish Collagen has been treated with a non-GMO food grade enzyme to provide low molecular weight protein for easy digestion. The ease of digestion will appeal to consumers with digestive issues. It also helps provide a full feeling (satiety) for consumers who are trying to lose weight. Collagen contains 7 of the 8 essential amino acids. It lacks tryptophan which can easily be obtained from many foods such as eggs, poultry, fish, milk or cheese.

(a) The Food and Drug Administration has not evaluated these statements. This product is not intended to diagnose, treat, cure, or prevent any disease.



Why Consumers like Norland Hydrolyzed Fish Collagen

- It's Pure, Hypo-Allergenic Protein
- Consumers can Make Their Own "Health and Beauty Drinks"
- It's Easy to Digest
- It has a Neutral Taste and Odor
- It has Orthodox Union Kosher Certification
- It has Halal Food Council S.E.A. Certification
- It is manufactured in a facility dedicated to marine products.
- **It does NOT Contain any Preservatives, Sulfites or Additives**



Nutritional Values of Norland Hydrolyzed Fish Collagen

HYDROLYZED FISH COLLAGEN AVERAGE NUTRITIONAL VALUES (Based on 10 gram serving)

Calories	45		
Moisture	0.6 grams	Sugars	0.0 grams
Total Fat	0.0 grams	Fiber	0.0 grams
Saturated Fat	0.0 grams	Protein	9.4 grams
Monounsaturated	0.0 grams	Calcium	0.05 milligrams
Polyunsaturated	0.0 grams	Iron	0.04 milligrams
Cholesterol	0.0 grams	Vitamin A	0.0 iu/gram
Sodium	20 milligrams	Vitamin C	0.0 milligrams
Total Carbohydrates	0.0 grams	Potassium	0.07 milligrams

US consumer laws require that products made with fish are labeled for fish allergen sensitive consumers.

At Kenney & Ross each batch of HFC is tested by an independent, accredited laboratory using an Enzyme Linked Immunosorbent Assay (ELISA)^a to measure the amount of allergen in the collagen. The allergen in fish is parvalbumin and is a water soluble protein that is substantially removed during the washing process prior to extracting the HFC. Results of each assay are displayed on the COA. For a comparison, many people are familiar with how serious peanut protein exposure is for peanut allergic consumers. The commercial ELISAs used to measure peanut protein have a sensitivity of 1 – 2.5 ppm. The ELISA we use to measure the fish allergen has a sensitivity of 0.02 ppm which is 50 times more sensitive.

We believe the HFC is safe for all consumers. Even so, it is recommended that consumers allergic to fish should consult with their doctors prior to ingesting the Hydrolyzed Fish Collagen.

a. Bremer M, Selecting a Suitable Food Allergen Detection Method, Food Safety Magazine, June/July 2009, 16-19, 53

<http://www.foodsafetymag-digital.com/foodsafetymag/20090607/?folio=16>



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