

June 30, 2023

LINISE Co., Ltd

Changes in the Specifications of SCP Complex-LS—Salmon Nasal Cartilage Extract as a Food Ingredient
(Standard Values of Undenatured Type II and XI Collagen)

LINISE Co., Ltd. (Sapporo, Hokkaido, Japan; Representative directors, Hideharu Nakano and Masaki Narumi) and Shoshi Mizuta, a professor of the Faculty of Marine Science and Technology, Fukui Prefectural University have been conducting joint research since April 2020. In the research, we found that **20% of salmon nasal cartilage collagen are type XI collagen** that has been known as a minor collagen accounting for only a small percentage of the cartilage.

ACCEPTED RESEARCH ARTICLE

A research article about the characterization of collagen in salmon nasal cartilage authored by Prof. Mizuta et al. (Fukui Prefectural University) was accepted by *Fisheries Science* (Characterization of collagen in salmon nasal cartilage: enzymatic solubilization with fungal acid protease. Published online on May 10, 2023).

According to this article, salmon nasal cartilage contains type XI collagen abundantly in addition to type II collagen that is a known major collagen in the cartilage. The content ratio is,

Type II collagen : Type XI collagen = Approximately 8 : 2.

Type V/XI collagens are recognized as minor collagens, and the relative quantitative proportion of Type V collagen has been reported as usually less than 5% of the total collagen in the fish muscle. Now, the research revealed **abundant type XI collagen uniquely contained in salmon nasal cartilage** and its subunit composition that has been unknown for type XI collagen.

On the basis of the Mizuta's report, we decided to add type XI collagen to the specifications of the food ingredient "SCP Complex-LS."

Considering that SCP Complex-LS has currently been used for a wide variety of products, changing the specifications may have a large impact on the market. Therefore, we provide information necessary to change product labels, descriptions, and other materials without trouble, and will execute the specification change in April 2024.

Instructions from the Consumer Affairs Agency in this regard

To take actions necessary for the change as soon as possible, however a period of time for the change is not specified because a new theory, which is an inevitable cause, is the reason for the change.

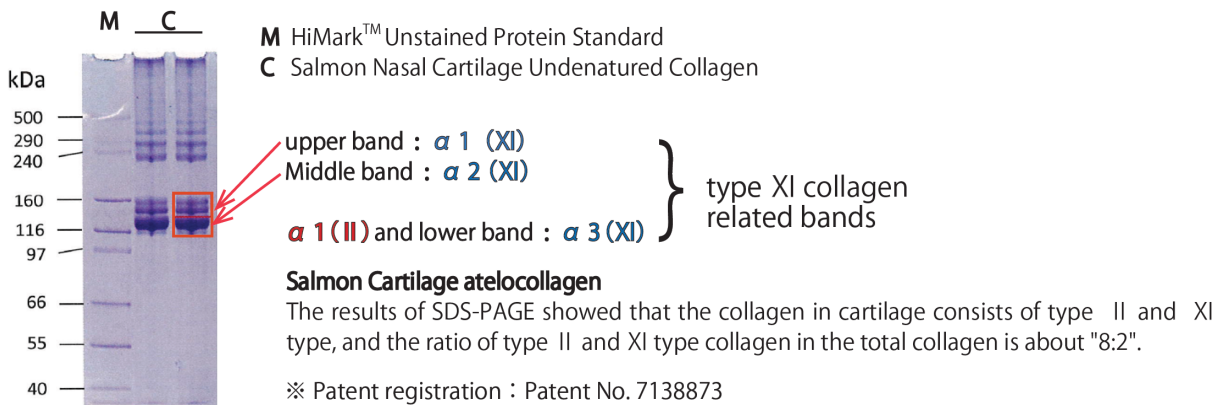
To make necessary changes to the label of foods with functional claims immediately.

CHANGES IN THE SPECIFICATIONS OF SCP COMPLEX-LS

	Present Until March 2024	New From April 2024	Test Method
Name	Salmon nasal cartilage extract	Salmon nasal cartilage extract	
	(Containing undenatured type II collagen and undenatured proteoglycan)	(Containing undenatured type II and type XI collagens and undenatured proteoglycan)	
Undenatured collagen	≥40%	≥40%	Amino acid automatic analysis
			(Colorimetric assay with dimethylamino benzaldehyde)
Content ratio of collagens	/	Type II : Type XI	Polyacrylamide electrophoresis
		8 : 2	
Undenatured proteoglycan	≥40.0%	≥40.0%	High-performance liquid chromatography
Molecular weight (undenatured proteoglycan)	2,000 to 4,150 kDa	2,000 to 4,150 kDa	Absolute molecular weight measurement (multiangle light scattering detection)

The following image is a result of SDS polyacrylamide gel electrophoresis (SDS-PAGE) on atelo collagen extracted from salmon nasal cartilage with the use of a patented technique (patent number: 7138873).

Analysis of this image indicated that the content ratio of type II collagen to type XI collagen in total collagen is 8 to 2.



SPECIFICATIONS-RELATED CHANGES TO LABELING

1. If your product labels/descriptions say that undenatured type II collagen is contained but not how much;

No changes to labeling are required. SCP Complex-LS does contain undenatured type II collagen.

2. If your product labels/descriptions say how much undenatured type II collagen is contained;

The term, “undenatured type II collagen,” needs to be changed to “undenatured type II and type XI collagens” or “undenatured collagen.”

For example: Containing undenatured type II collagen 10 mg
 → Containing undenatured type II and type XI collagens 10 mg
 or
 → Containing undenatured collagen 10 mg

3. If your product labels/descriptions say that undenatured collagen is contained with or without the content amount;

No changes to labeling are required.

*** If you would like to describe the content of each of type II collagen and type XI collagen;**

Please contact us so that we make an appropriate strategy for you (e.g., describing the content ratio in a certificate of analysis).

ACTIONS FOR FOODS WITH FUNCTIONAL CLAIMS

We completed a human clinical study on the undenatured type II and type XI collagen as functional substances, of which results have been reported (*Jpn Pharmacol Ther.* 2023;51[6]:909-20). The study results showed that **these collagens relieved discomfort in the knees occurring during exercises.**

Systematic review that can be used for application for foods with functional claims will become available by the end of the year.

[Launching a Research Reagent]

On a different note, **a research reagent (salmon cartilage undenatured type II and type XI collagens)** will be launched by Cosmo Bio Co., Ltd. in or after July 2023.

Quantitative determination of undenatured collagen requires polyacrylamide electrophoresis assay; therefore, analytical reagents are needed.

We will maintain a stable supply of our high-functional, high-quality products under the strict quality control based on HACCP principles.

Thank you for choosing our food ingredients. We look forward to a continued business relationship.

Salmon Nasal Cartilage Undenatured Collagen

Cat. No. SNCUC10

Version : 18 July, 2023

【 I 】 Product information

Storage temperature : -20°C

Store in blackout bottle and light-shielding bag. Avoid high temperatures and high humidity.

Source	Volume	Packaging specification
Salmon Nasal Cartilage	10 mg	blackout bottle (Outer package : Aluminum bag)

【 II 】 Solvent and Solubility

Dissolve in small amount of water(Distilled water) to adjust to desired concentration.

【 III 】 Product specifications

Measurement	Specification	Analytical Procedure
Description	White flocculent Slightly characteristic odor	Sensory evaluation
pH	6.0 ~ 8.0	pH meter measurement
Water content	≤ 5.0 %	Loss on Drying Test
Total collagen (Cartilage,Undenatured)	88.0 % ≤	Automated amino acid analysis (Dimethylamidobenzaldehyde colorimetric method)
type II collagen	53 ~ 75 %	Polyacrylamide gel electrophoresis
type XI collagen	13 ~ 35 %	



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[Company Outline]

LINISE (established in January 2011) manufactures proteoglycan, a functional substance, from underutilized resources—the nasal cartilage of salmon (*Oncorhynchus keta*) caught in the seas around Hokkaido. LINISE does all manufacturing processes to finish products in-house, including raw material (salmon heads) procurement in cooperation with local seafood processing companies.

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Production Plant 2: 298-1, Takadai, Iwanai, Hokkaido, 045-0013 Japan

Business description: Production of food and cosmetic raw materials. Design and contracted manufacture of health foods and cosmetics.

URL: <https://www.linise.co.jp/> (in Japanese and English)

<https://www.linise-pg.com> (in English and Chinese)

[Contact Information for Inquiries About This Matter]

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