



Linking Glycoscience and health longevity

MARUKYOU BIO FOODS Co.

Nano247

Food safety

Food safety of chondroitin sulfate oligosaccharides

Bridging Glycobiology and Healthy Longevity

■ Ingredients

The raw material, chondroitin sulfate, is extracted from the cartilage of skates, which are natural fish from Hokkaido.

Therefore, they are not affected by antibiotics or artificial feed.

Skates from Hokkaido have a long history of being eaten. They are commonly sold in food supermarkets and fresh fish shops.



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■ Manufacturing Method

The high-molecular-weight chondroitin sulfate extracted from skate cartilage is reduced to a low molecular weight using a patented microchemical process.

This process involves hydrolysis using high-temperature, high-pressure subcritical water, so it is possible to sterilize all bacteria, including heat-resistant spores.

The subsequent purification and powdering processes are carried out in a sealed space, so it is possible to manufacture an extremely safe product.

These processes are carried out in a GMP-certified factory.

Each lot of product is inspected to ensure that it conforms to quality control standards.

Since its launch in 2013, we have shipped more than several hundred kilograms of chondroitin sulfate oligosaccharide, but there have been no reports of health problems or adverse events.



Manufacturing process

| No. | Process |
|-----|------------------------------------|
| 1 | raw materials(Fish cartilage) |
| 2 | enzyme treatment |
| 3 | clarifying filtration |
| 4 | ultra filtration |
| 5 | heat sterilization |
| 6 | subcritical water treatment |
| 7 | concentration with ultrafiltration |
| 8 | activated carbon treatment |
| 9 | spray drying |
| 10 | classification |
| 11 | metal inspection |
| 12 | measurement and packing |

This product is manufactured in accordance with the health food raw materials GMP of the Japan Health and Nutrition Food Association.



Safety of chondroitin sulfate oligosaccharides

| items | Analysis Test Results |
|---|---|
| Total number of bacteria | 3,000cfu/g or less |
| Coliform bacteria | Negative |
| Mold count | Negative |
| Yeast count | Negative |
| Number of heat-resistant spores | 300cfu/g or less |
| Acute oral toxicity after a single dose | 2,000m g / k g or more |
| Repeated dose toxicity test for 28 days | Less than 1,000mg/ k g |
| Mutagenicity (Ames TEST) | Negative |
| Human intervention study | (1) UMIN000023492: No abnormalities at 100mg/day/man/8week (2) UMIN000052732: No abnormalities at 100mg/day/man/12week |
| Cytotoxicity test(bioluminescence method) | Negative |

Product Specifications

| Item | Result | method |
|--|-----------------------|------------------------------------|
| Appearance | White to beige powder | Visual |
| Chondroitin Sulfate Assay | Minimum 80.0% | HPLC method |
| Weight - average molecular weight (Mw) | 3000 or less | HPLC method |
| Moisture | Maximum 10.0% | Infrared moisture meter |
| pH (1% solution) | 3.0 - 5.0 | Glass electrode |
| Heavy metal (as Pb) | Maximum 10ppm | Sodium sulfide colorimetric method |
| Viable bacteria Count | Maximum 3,000 cfu/g | Standard agar plate culture method |
| Escherichia coli | Not detected | BGLB method |
| Granularity | 30 mesh pass | Sieve separation |

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