

## CIRCULAR ECONOMY BUSINESS CASE STUDIES IN SOUTHEAST ASIA



## Pinmisa

- Samut Sakhon Province, Thailand
- Cosmetic
- [www.facebook.com/pinmisa](https://www.facebook.com/pinmisa)
- Analysis period: 2019-2023

## Circular Economy in Skin Care Products

## Business Spotlight

Seafood processing produces waste and by-products with considerable negative environmental, social, and economic impacts, and which have thus far remained largely unaddressed in Thailand. Operating in the coastal Samut Sakhon Province of Thailand, the CEO and Founder of Pinmisa saw the opportunity to extract using natural processes cosmetic ingredients from fish bones. Specifically, fish bone hyaluronic acid can be concentrated into a hyaluron booster serum to reduce facial wrinkles. Research and development at Pinmisa to create this cosmetic product and to obtain the necessary certifications took 2 years. The business achieved cost recovery for its net operational cost after the product launch. The COVID-19 pandemic caused a sales drop of about 10%; 50% of the company's sales goes to regular customers.

Pinmisa serves a high-end niche market with reputable retailers such as King Power Duty-Free Shops and Siam Paragon and Icon Siam department stores. The rainy season adversely affects the extraction process from fish bone waste, which means that the company manufactures hyaluronic acid only during 4 to 6 months maximum. The hyaluronic acid extracted during producing months

is stored. It is processed and bottled as the final product upon confirmation of customer orders.

**Keywords**

Cosmetic products, Fish bone waste

**Innovation**

Product/Service design, End-of-life management, Resource circularity



# Analysis of Pinmisa

## Context and baseline

In 2017 Thailand exported USD 6.6 billion worth of processed seafood.<sup>1</sup> Samut Sakhon Province is Thailand's principal seafood location and the major manufacturer of processed seafood. The leftovers and waste from seafood processing have long been largely neglected despite their negative environmental, social, and economic impact. Pinmisa was set up by a local entrepreneur in Samut Sakhon Province. The company uses a natural process to extract hyaluronic acid from fish bones as an ingredient for cosmetics and medical supplements, offering a potential for higher prices compared to processing fish bones for animal feed or into pet snacks.

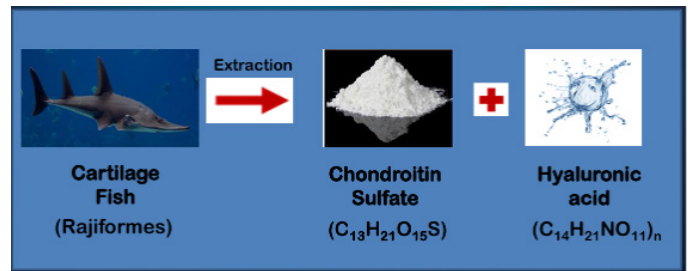
Following extensive research and development with several science institutes, in 2019 the firm confirmed its proprietary highly-efficient extraction process which produces high-quality hyaluronic acid. Because cosmetic ingredients such as chitosan, chondroitin sulphate, collagen, glycosaminoglycan, and especially hyaluronic acid are costly and imported, Pinmisa embarked on the local production of cosmetics combining traditional knowledge of medicinal herbs with advanced scientific data on hyaluronic acid.

## Innovation

Pinmisa spun off from an established family business involved in preparing seafood material for canned seafood producers in Samut Sakhon province. The founder was therefore well aware of established practices and challenges in preparing high-quality seafood and seafood waste removal. Thus in 2011 the firm embarked on developing its own extraction process for hyaluronic acid from fishbones for use in beauty skincare products. Hyaluronic acid benefits soft tissue function such as joint support, and it helps remediate osteoarthritis. Hyaluronic acid is partially responsible for cartilage resilience and its ability to resist compression. As one of the chief components of the extra-cellular matrix, hyaluronic acid is an important component of articular cartilage.

During 2012–2014, the formula was jointly developed by Pinmisa and the Department of Chemistry, Faculty of Sciences of the King Mongkut's University of Technology Thonburi (KMUTT). The firm's research on chondroitin sulphate cosmetic project and hyaluronic acid from fish cartilage extract (P11-BP-59-06-013), at pilot scale, focused on extracting both chondroitin sulphate and hyaluronic acid from shark cartilage. The benefit of using hyaluronic acid

in cosmetics includes anti-aging, wrinkle reduction, skin enhancement and improvement of skin firmness and elasticity.



The cosmetic formulation combines 2% bio-active hyaluronic acid with herbs and natural products, selected with the use of traditional knowledge and medicine. The resulting formulation supports natural healing of the skin. The firm has developed four main products: booster serum, hyaluron soap, hya brighter lotion, and a deep regeneration cream. The booster serum ingredients, to cite one example, include distilled water, hazel water, sodium hyaluronate, centella asia aloe vera callus, hoodia gordonli, garcinia mangostana peel, rice bran, monordica coachinchinensis fruit, carbomer 940, triethanolamine, chitosan, propylene glycol and phenoxy ethanol.



In 2017 the firm applied for a certificate for Good Manufacturing Practices (GMP) from the Food and Drug Administration, Ministry of Public Health, Thailand. In 2018, the Institute of Molecular Biosciences, Mahidol University and Naresuan University conducted two clinical tests with 30 people for the comparative evaluation of Pinmisa's fish-bone product compared to other hyaluronic supplements produced from animal origin. The tests focused on actual cutaneous tolerance of the cosmetic products and anti-wrinkle efficiency, and found that the Pinmisa product was highly effective and without allergies in the human body.

<sup>1</sup> <https://marketeeronline.co/archives/115438>

In 2018 the Thailand Institute of Science and Technology Research (TISTR) conducted laboratory safety and efficiency tests on a prototype cosmetic product formula and found that the Pinmisa products demonstrated four times higher efficiency than French standards. In addition, Assumption University conducted a customer satisfaction survey with 200 customers and found that 80% of respondents were satisfied with Pinmisa products for the following 8 aspects:

- the scent the customer gets when it is on her/his skin;
- skin softness after use;
- moisturizing after application;
- stickiness;
- ease of absorption into the skin;
- ease of spreading of the cream;
- smell before use; and
- viscosity before application.

In 2019, two products (deep regeneration cream and booster serum) were certified as having no microbial efficacy. The firm obtained licenses from the Food and Drug Administration, Ministry of Public Health (Thailand) to be a producer and sale agent of these products. Every three years, the firm is required to repeat similar tests and renew its licenses.

### Circular Economy impact

The extraction of hyaluronic acid from fish bone waste is a resource recovery practice, as it turns the previously discarded fishbones into a value-added product, thus supporting the circular economy transition.

Every year the hyaluronic acid production process helps to transform 2 metric tonnes of fish bones into 500 l of ingredients for the firm's products, thus developing, expanding, and increasing the value of those ingredients. Some 300 kg/year of other ingredients are used particularly herbal and other natural products. Pinmisa does not use any chemically synthesised ingredients.

The company neutralises its waste water, and removes the suspended substances in sedimentation tanks, from which sediment is recovered for use in agricultural soil improvement.

### Business and market impact

Pinmisa spent about two years completing R&D and certification, starting production in 2018. Within two years of starting production, the company achieved cost recovery for the production investment including

R&D, equipment, and other fixed cost. Sales dropped about 10% due to the COVID-19 pandemic, but the company was able to consolidate its customer base with about 50% of its sales to regular/repeat customers. Average monthly revenue from the sales of their skin products is about BHT 30,000 (about EUR 780). In 2024, the firm is investing in product development, public relations, and higher ingredient quality.

The age of the targeted buyers is those over 40, with higher purchasing power and who are the most likely to procure and use skin-care products. The company runs the extraction process for only about 4 months annually, subsequently producing skin-care products on the basis of customer orders during the rest of the year. Pinmisa sells chiefly to high-end retailers such as King Power Duty-Free Shop, ICOM Siam, and Siam Paragon.

### Stakeholders

The hyaluron cosmetic has received several certifications, awards, and recognition for both its technical and business achievements, such as an innovation award by the Thailand Institute of Scientific and Technological Research (TISTR) in 2017; selection by the Thailand Nanotechnology Association to exhibit its products at the 2018 Mekong Beauty Show 2018 in Vietnam; China-Asian Expo in 2018; Cosmetic 360 Paris in 2018; the best of Thailand Cosmetic Contest in innovation in cosmetics in 2019; and Thailand Festival 2019, Tokyo, Japan.

The company has benefitted from the hyaluronic acid extraction and chitosan research projects of the Department of Chemistry, King Mongkut's University of Thonburi (KMUTT). In addition it has received funding support from the National Innovation Agency (NIA) for its production process and from the Thailand Centre of Excellence for Life Sciences (TCELS, a public organisation) for allergy testing by Naresuan University, and for product safety and efficiency testing by the Thailand Institute of Science and Technology Research (TISTR).

In addition, Pinmisa has received business training under the One Tambon One Product (OTOP) startup project. Ten local herb growers supply Pinmisa annually with about 300 kg of high-quality herbs under the OTOP scheme.

## Implementation

Pinmisa trialled to increase its scale of production by outsourcing production to two cosmetics producers; however, results were unsatisfactory and trials were discontinued because of quality control deficiencies (regarding ingredient use and production practices). Pinmisa has since focused on in-house production and selling to niche markets through established retailers.

In the competitive cosmetic market, the business builds its reputation with certifications and maintaining the quality of products. Public relations through media help to boost product reputation.

## Takeaways

The CEO expressed that new start-up businesses can only grow through self-learning. Start-ups need to develop their own business relations with suppliers, government agencies and large-scale businesses. To grow in a sustainable way, start-ups can only gradually develop in a stable and self-sufficient way.

Product research and development and capacity building of the of start-ups like Pinmisa are key inputs for continuing the start-up process. Therefore, specific training and research for start-ups are required.



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## Disclaimer

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