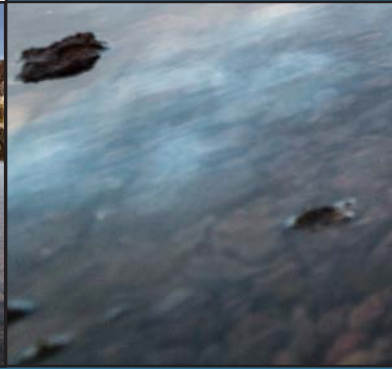


ASTAKEY

PURE NATURAL
ICELANDIC
ASTAXANTHIN



HIGH-QUALITY ASTAXANTHIN

"Astaxanthin is produced around the world in open pond technology, tubular systems or flat panel systems, none of which fulfilled our vision"

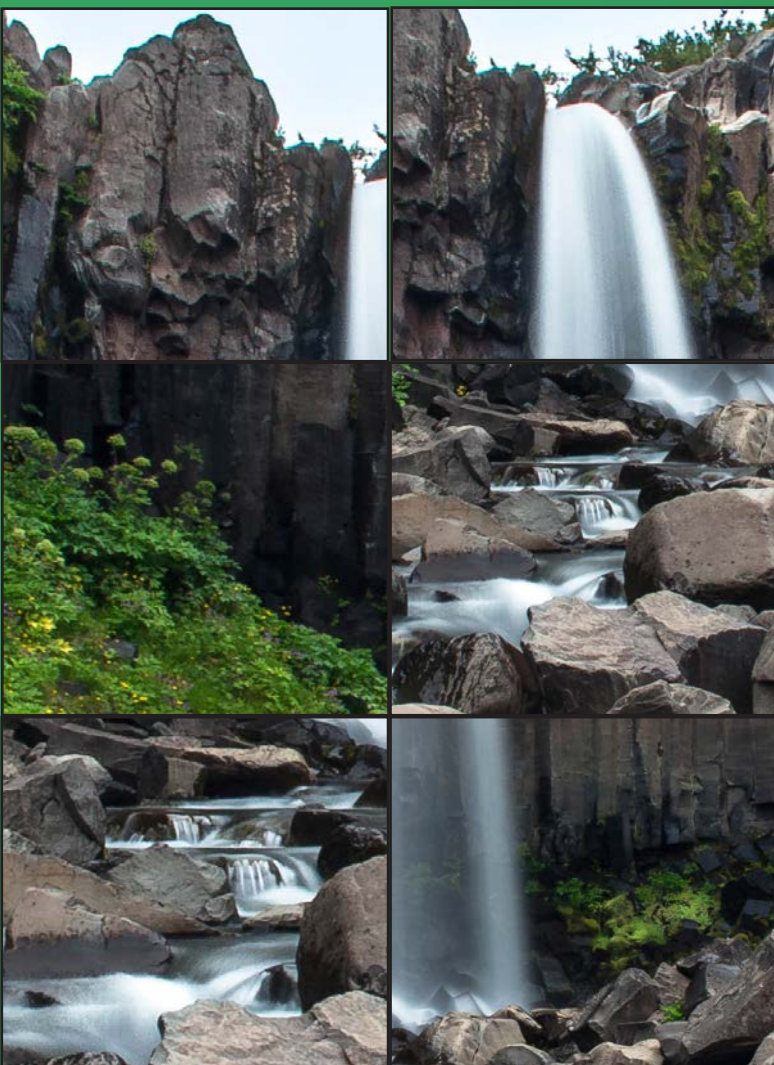
Our microalgae: **Haematococcus pluvialis**

We produce our natural AstaKey™ Astaxanthin from the microalgae *Haematococcus pluvialis*. Our microalgae thrives in pure sustainable Icelandic spring water and yields high-quality astaxanthin. The energy utilized during production comes from renewable geothermal and hydroelectric sources.

Our vision

The SagaNatura team has designed an innovative patent pending tank-based photobioreactor (PBR) to grow microalgae. The design of our systems ensures safety and the highest quality of the raw material. In order to deliver the best products possible our manufacturing division focuses on the following factors.

- Growing algae in the purest Icelandic water
- Green geothermal and hydroelectric energy
- Utilizing patent pending PBRs that are easy to clean and disinfect
- Utilizing smart systems to ensure stable conditions
- Minimizing downtime between batches to a few hours and grow 24 hours/day
- Utilizing PBR that are easy to scale up



"There are around
10,000 plus waterfalls
in Iceland. Our water
is a key component"



SagaNatura

"Iceland has tapped the earth's natural warmth to supply 85% of the country's housing with heat. Between geothermal and hydropower, the electricity supply is 100% renewable energy"



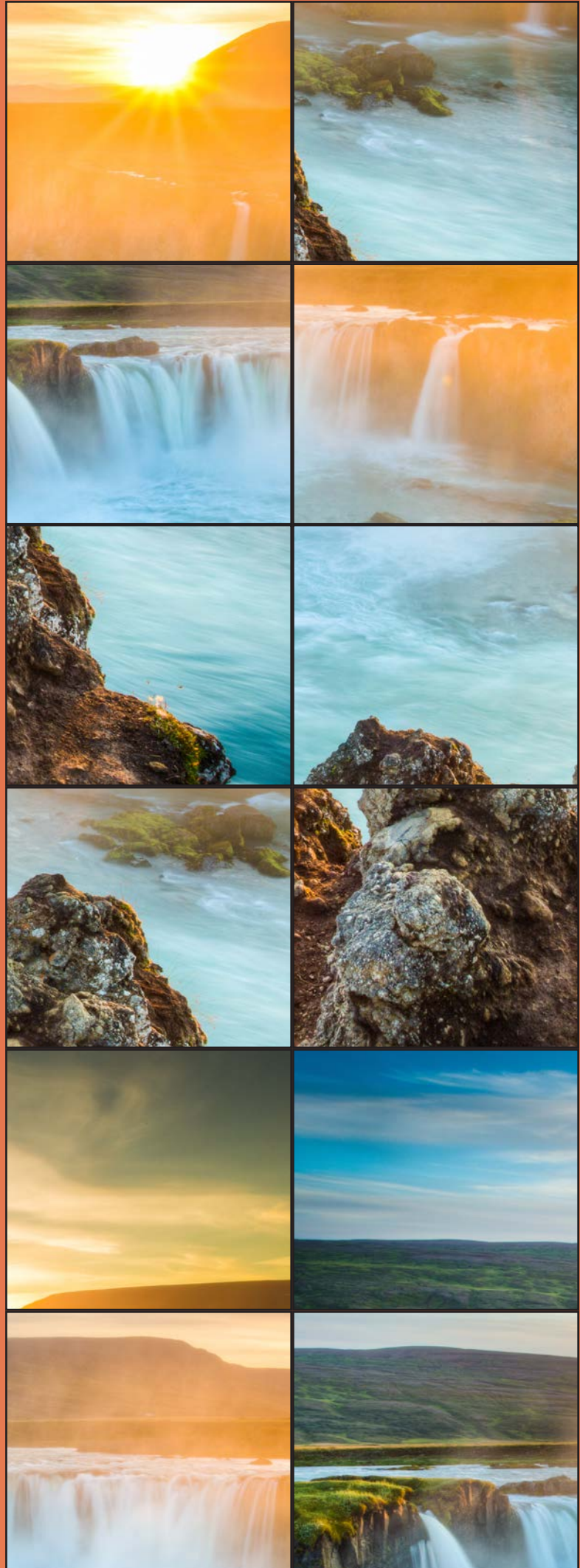
SagaNatura

HIGH-QUALITY ASTAXANTHIN

Innovative production technology

Our spirit of innovation resulted in a patent pending microalgae culturing technology, a photobioreactor, that utilizes significantly less space and energy per kg microalgae biomass than other traditional photobioreactors. Our photobioreactor system ensure safe, high quality microalgae cultivation. Each meticulously engineered photobioreactor secures a harvest of microalgae in any type of climate and ensures stable productivity levels.

“Our spirit of
innovation resulted
in a patent pending
microalgae culturing
technology, a
photobioreactor”





ASTAXANTHIN PRODUCTION PROCESS

In nature, microalgae produce Astaxanthin to protect themselves from the harmful UV rays of the sun, taking them from bright green to deep red, due to the pigmentation of Astaxanthin. We on the other hand expose the algae to strong lights using Iceland's geothermal energy and hydroelectric power to promote the production of Astaxanthin in the algae.

1. The Beginning

We start out in a disinfected cultivation lab where *Haematococcus pluvialis* (H.p) microalgal culture is propagated from a single colony of algae to inculum flasks

2. Scale Up

When the inoculum is ready the seed culture is transferred into photobio-reactors (PBR). In the vegetative phase (green phase) the algal cell multiply and increase in size

3. Astaxanthin Synthesis

The astaxanthin induction phase (red phase) where astaxanthin accumulates within the algal cells

4. Harvesting

Following termination of the red phase, the microalgae culture is harvested through centrifugation where the output is slurry of algal cell-mass

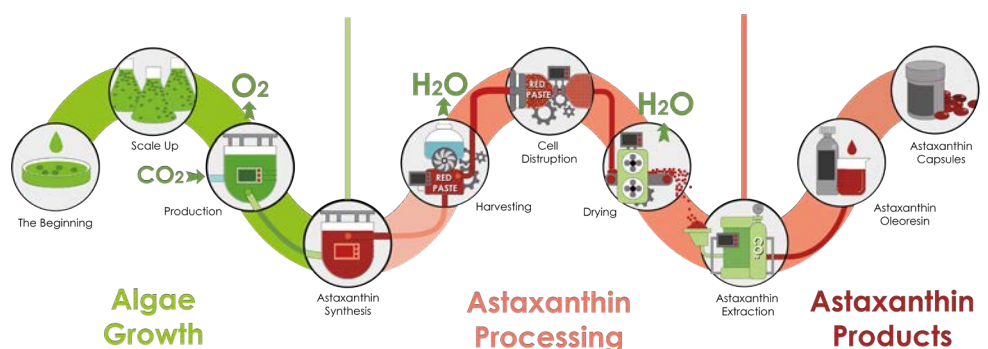
5. Grinding and drying


The cells comprising the slurry are then disrupted and the slurry is fed into a belt-dryer discharging flakes of homogenized H.p biomass

6. Extraction

An extraction step is added for products utilizing astaxanthin oleoresin instead of astaxanthin rich biomass. Extraction is performed using Supercritical CO₂ technology

“Visual map of our production process for Astaxanthin. Sometimes a picture is worth a thousand words. Take a look!”



A photograph of a geothermal landscape in Iceland. In the foreground, a dark, circular geyser vent is visible, with a large plume of white steam rising from it. The surrounding ground is covered in mineral deposits, showing shades of blue, yellow, and brown. In the background, there are rolling hills and mountains under a cloudy sky. The text is overlaid on the upper right portion of the image.

"Iceland is the only country in the world which obtains 100% of its electricity and heat from renewable sources. 87% of its electricity comes from hydro-power, and the remaining 13% from geothermalpower."



SagaNatura



SagaNatura

Suðurhella 8
221 Hafnarfirði - Iceland
SagaNatura@SagaNatura.com
Phone: +354 562 8872