



Framþróun og ræktunartækni smáþörunga

Strandbúnaður 2017, Grand Hotel Reykjavik, 13-14 mars | Tryggvi Stefánsson

YFIRLIT

**Pörunga-
ræktun á
Íslandi?**



**Mismunandi
ræktunarkerfi**



**Astaxanthin og
*Haematococcus***



**Framleiðslu-
ferlið**



The Algalif way



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add life to
your formulas™

Þörunga- ræktun á Íslandi?



Smápörungar á Íslandi



Kostir:

- “Ódýr”, endurnýtanleg orka
- Hreint vatn
- Jákvæð markaðsmynd
- Stöðugt hitastig (!)
- Ágætt sérþekking (er að batna)
- Jákvætt viðhorf til nýsköpunar
- Tiltölulega einfalt leyfiskerfi

Ókostir:

- Ótryggt gengi krónunnar og hlutfallslega hár launakostnaður!

Mismunandi ræktunarkerfi

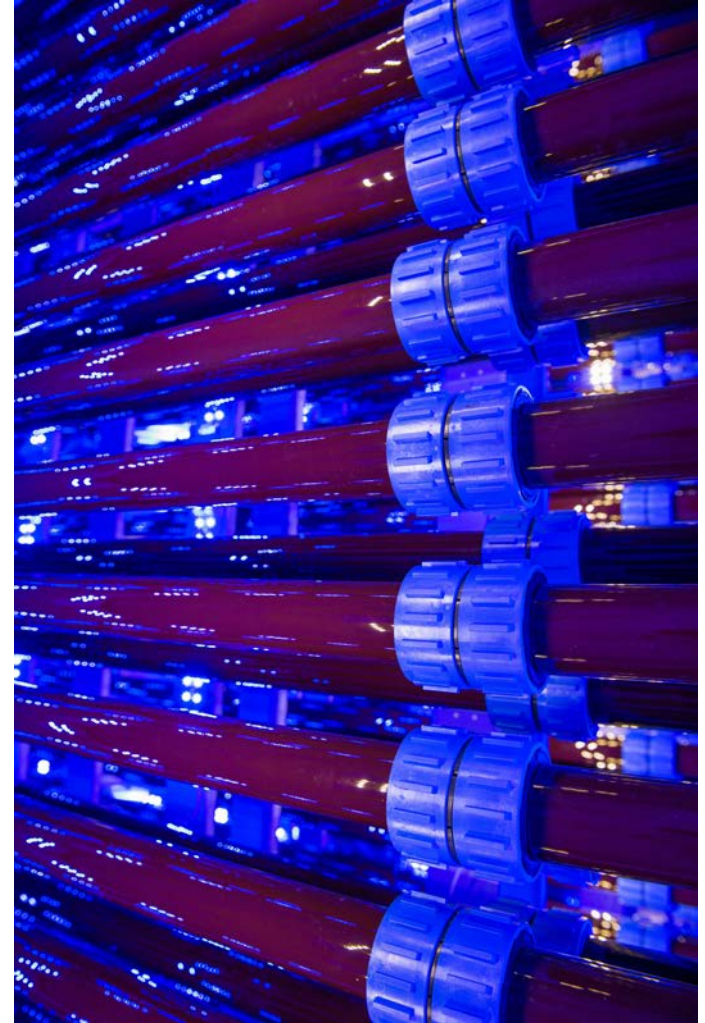




“High quality drinking water from Hawaiian aquifer”










“Pristine Himalayan water”



Opin vs. Lokuð kerfi

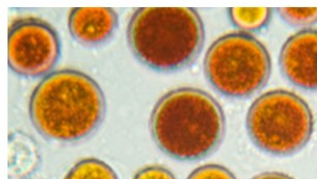


	OPIN KERFI	LOKUÐ KERFI
Smithætta		
Þrif		
Vatnsnýting		
Framleiðni/rúmmál		
Áreiðanleiki framleiðslu		
Orkunotkun		
Stofnkostnaður		

Astaxanthin og ***Haematococcus***



Primary
producer



Consumer,
Level 1

crustaceans



Consumer,
Level 2

fish & birds



Consumer,
Level 2-3

humans

microorganisms

Natural Astaxanthin is Stronger Than Other Antioxidants*

6,000X

Vitamin C

770X

Coenzyme
Q10

100X

Vitamin E

55X

Synthetic
astaxanthin

5X

β-carotene

3X

Lutein

2X

Lycopene

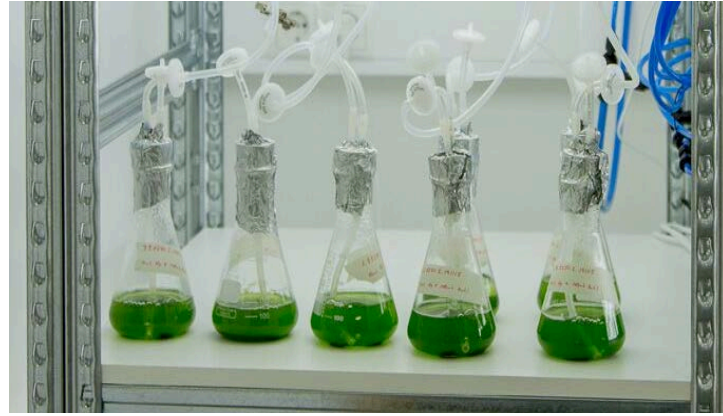
Markaðurinn



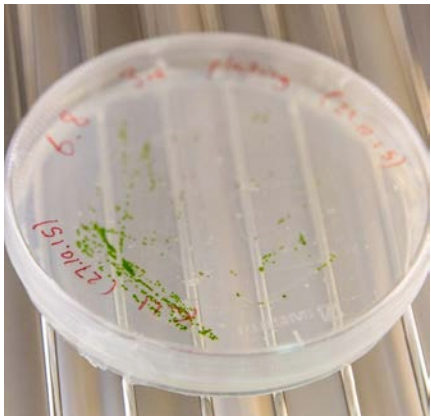
- Lang stærstur hluti astaxanthins er í dag framleiddur með efnafræðilegum aðferðum (synthetic) og notað sem litarefni í fiskifóður
- Ört vaxandi markaður fyrir náttúrulegt astaxanthin, sérstaklega úr *Haematococcus pluvialis* (smáþörungum)
 - Notað í fóður, fæðubótarefni, snyrtivörur og ýmiskonar “functional food”
- Verð fyrir náttúrulegt astaxanthin úr *Haematococcus* er í kringum 10.000 USD/kg
- 300 tonna heildarmarkaður (synthetic + náttúrulegt)?
 - 1/10 af því náttúrulegt astaxanthin?

Framleiðslu- ferlið

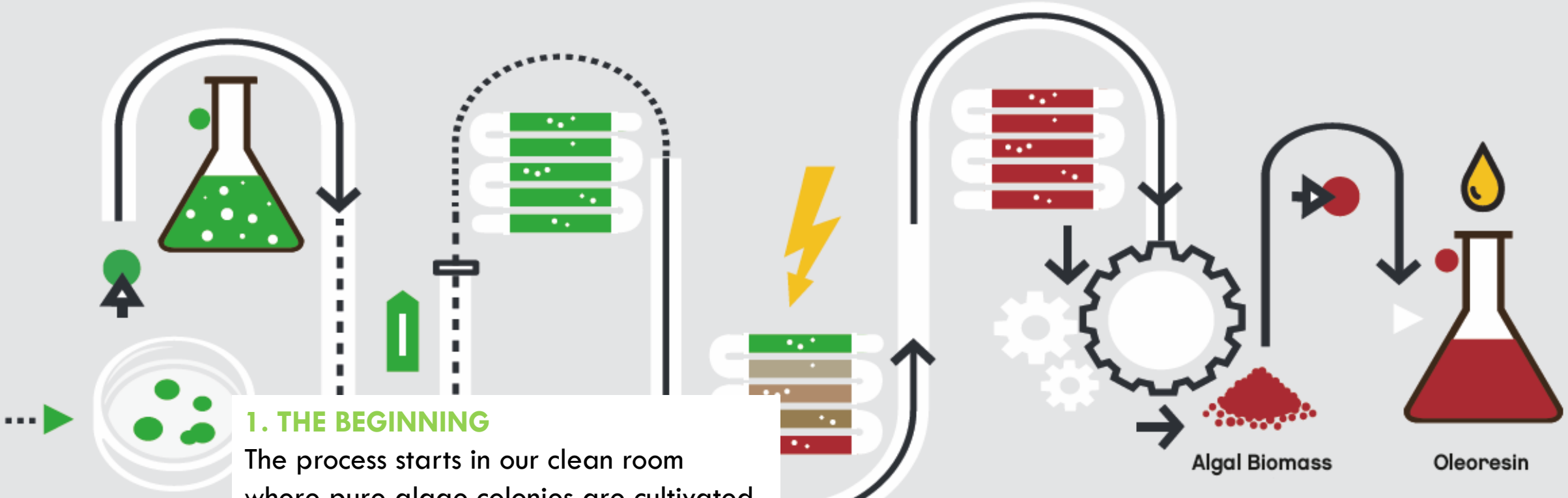




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GREEN PHASE



1. THE BEGINNING

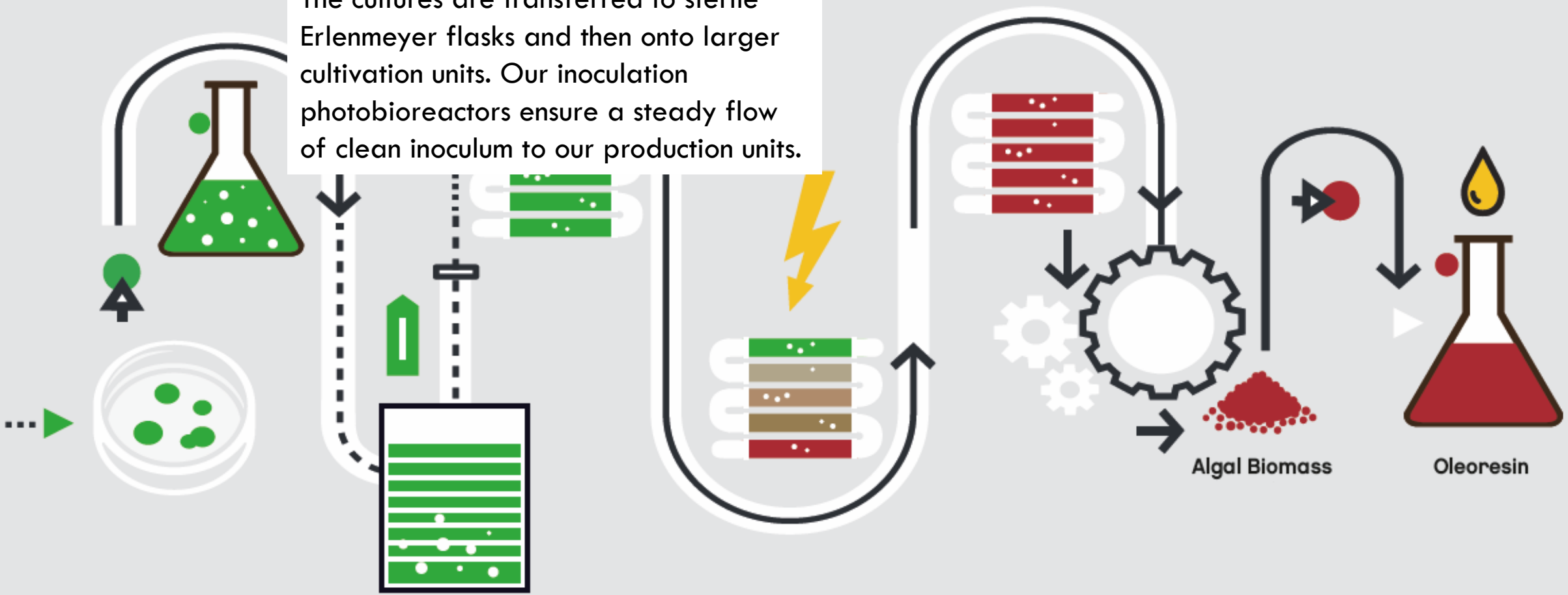
The process starts in our clean room where pure algae colonies are cultivated under controlled conditions by a team of dedicated cultivation experts.

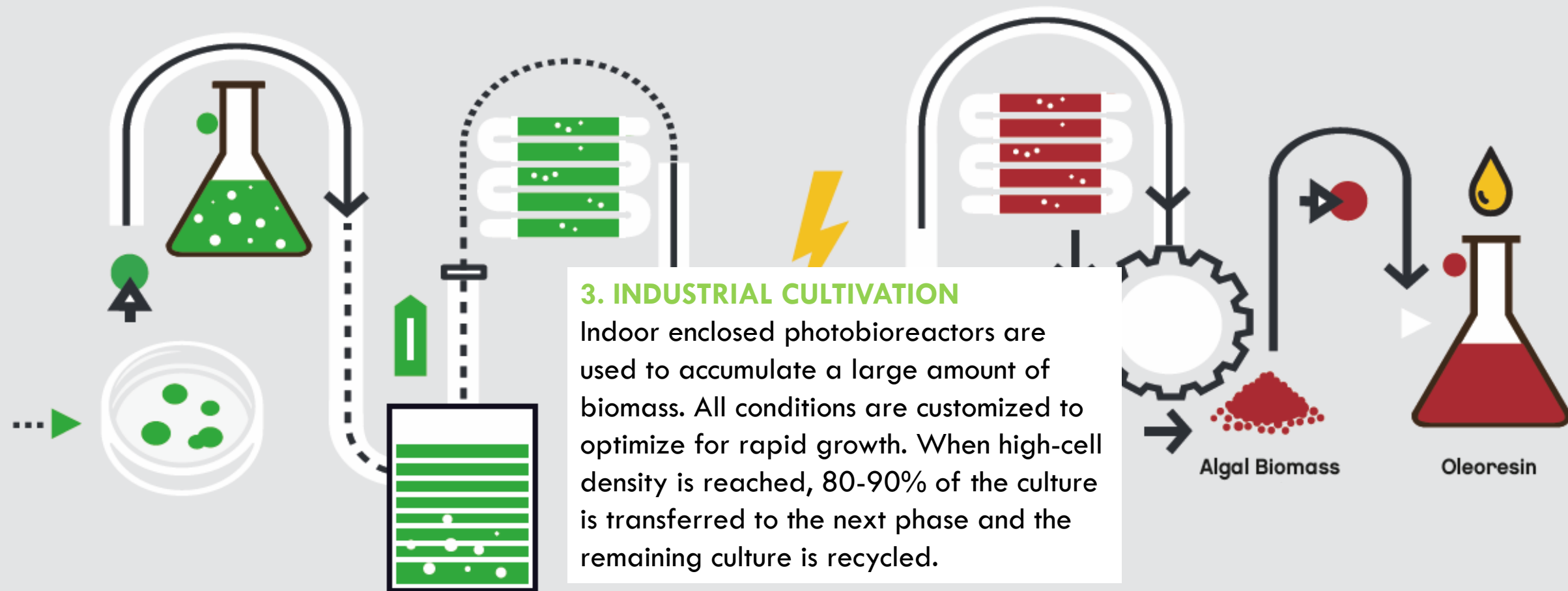
Algal Biomass

Oleoresin

2. SCALE UP

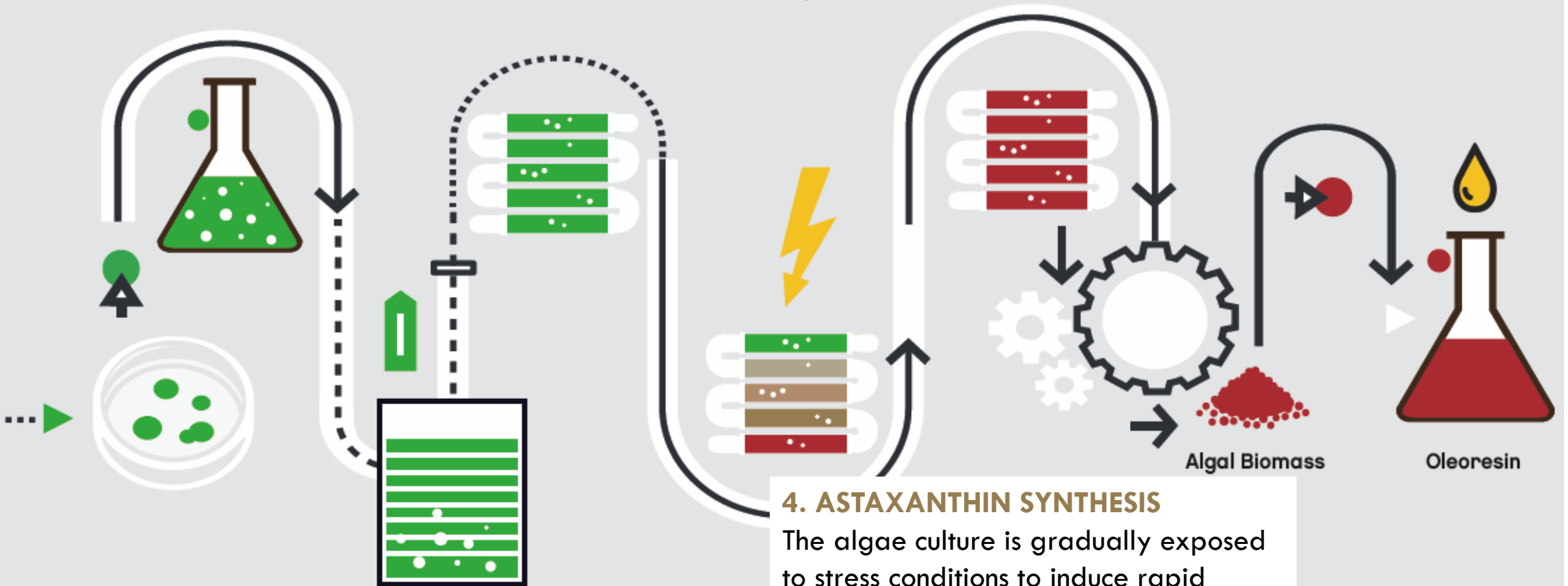
The cultures are transferred to sterile Erlenmeyer flasks and then onto larger cultivation units. Our inoculation photobioreactors ensure a steady flow of clean inoculum to our production units.





3. INDUSTRIAL CULTIVATION
Indoor enclosed photobioreactors are used to accumulate a large amount of biomass. All conditions are customized to optimize for rapid growth. When high-cell density is reached, 80-90% of the culture is transferred to the next phase and the remaining culture is recycled.

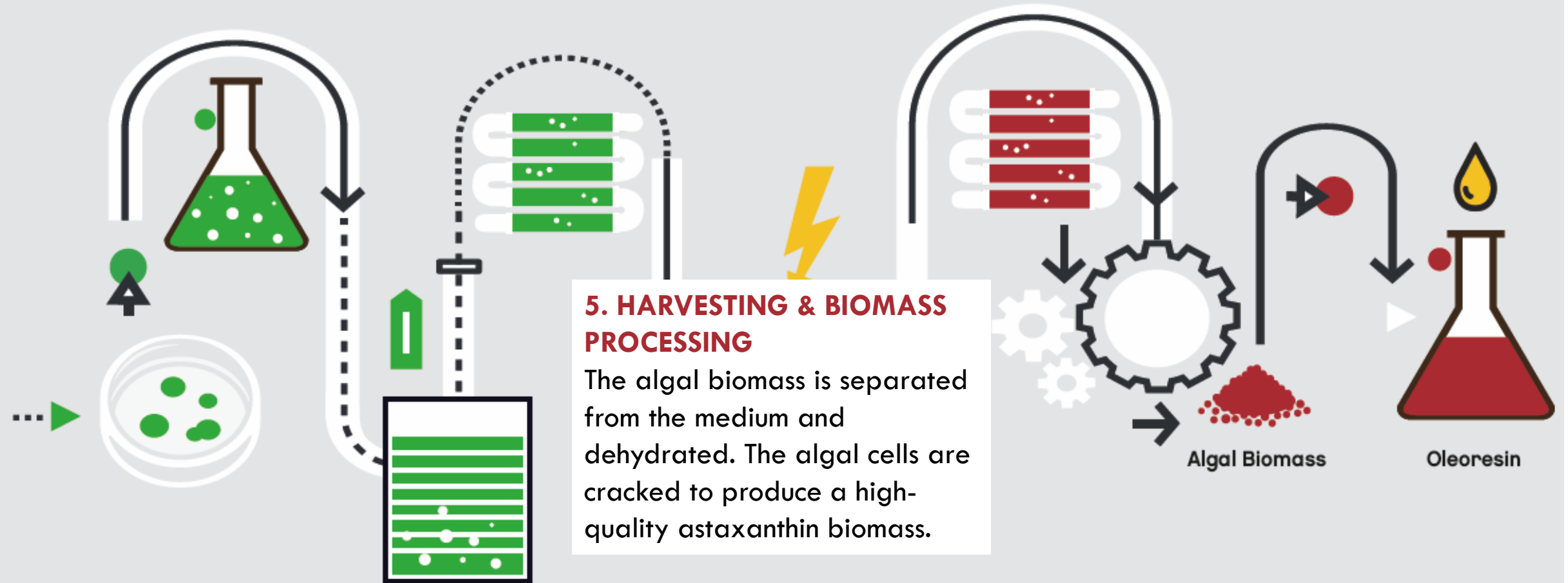
STARVATION PHASE



4. ASTAXANTHIN SYNTHESIS

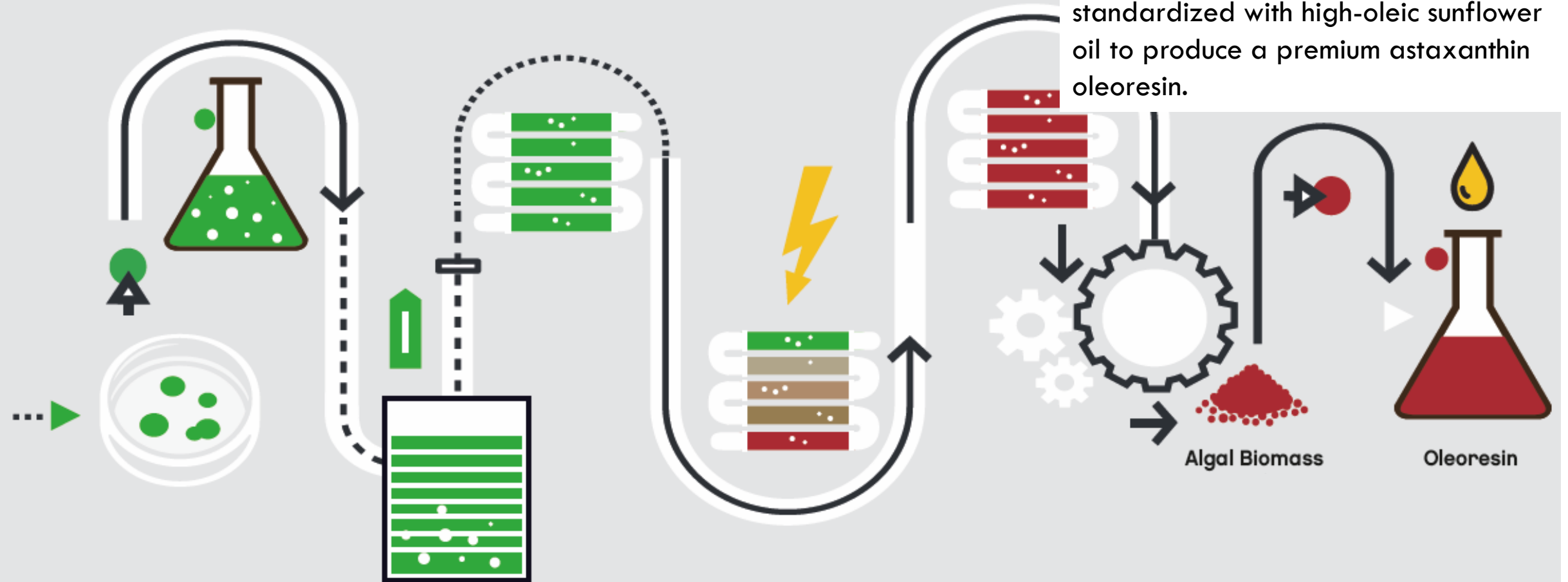
The algae culture is gradually exposed to stress conditions to induce rapid astaxanthin synthesis. When a high amount of astaxanthin is accumulated, the culture is harvested.

RED PHASE



6. ASTAXANTHIN RECOVERY

Astaxanthin is recovered using solvent-free, supercritical CO₂ extraction and standardized with high-oleic sunflower oil to produce a premium astaxanthin oleoresin.



The Algalif way



The Algalif way



- Ræktunin fer fram innandyra þar sem hægt er að stjórna öllum mikilvægustu ræktunarskilyrðum
- Framleiðsla í gangi allan sólahringinn, allt árið
 - Innan við 1% downtime á mánuði vegna þrifa
- Sérsmíðuð ræktunarkerfi
- Sérhönnuð LED lýsing
- Mikil áhersla á gæðamál og smitvarnir
 - Líftækniverksmiðja með lyfjaframleiðslu viðmið

Gæði og öryggi í fyrirrúmi



- 100% náttúruleg vara
- Ekki erfðabreytt
- Náttúrulegt astaxanthin með GRAS vottun í USA
- Gluten frítt
- Mjög lág þungmálmagildi
 - Langt undir öllum viðmiðunarmörkum
- Laust við ofnæmisvaka
- Engir lífrænir leysar notaðir
- cGMP vottun
- Halal vottun
- Kosher vottun
- Hreint vatn
- Endurnýtanleg orka

Framleiðsla og vörur



Framleiðslugeta

- 1.5-2 tonn af astaxanthini á ári
- 30-40 tonn af lífmassa á ári
- +5% astaxanthin styrkur
- +0.5 g/L vöxtur á dag


Vörur


- 5% og 10% astaxanthin oleoresin
- 5% astaxanthin biomass
- New formulations: Powder, beadlets, water soluble


FRÍHÖFNIN





Best Sellers in Astaxanthin Nutritional Supplements


- 

1. **Astaxanthin (12mg) with Organic Coconut Oil...**
★★★★☆ 1,800
\$23.95 ✓Prime
- 

2. **BioAstin Hawaiian Astaxanthin – 50 ct...**
★★★★☆ 1,685
\$25.22 ✓Prime
- 

3. **BioAstin Hawaiian Astaxanthin – 120 ct...**
★★★★☆ 1,134
\$22.75 ✓Prime
- 

4. **Jarrow Formulas Astaxanthin, Supports...**
★★★★☆ 267
\$17.62 ✓Prime
- 

5. **Algalife Icelandic Astaxanthin, 60...**
★★★★☆ 54
\$17.28 ✓Prime
- 

6. **Jarrow Formulas Astaxanthin, Supports...**
★★★★☆ 267
\$11.90 ✓Prime





Keilir
Miðstöð vísinda,
fræða og atvinnulífs



HÁSKÓLI ÍSLANDS



Takk fyrir!

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