

# Clean High Grade Algae

Optimum Spirulina  
production & Bio-compounds

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# Spirulina Cultivation Systems History



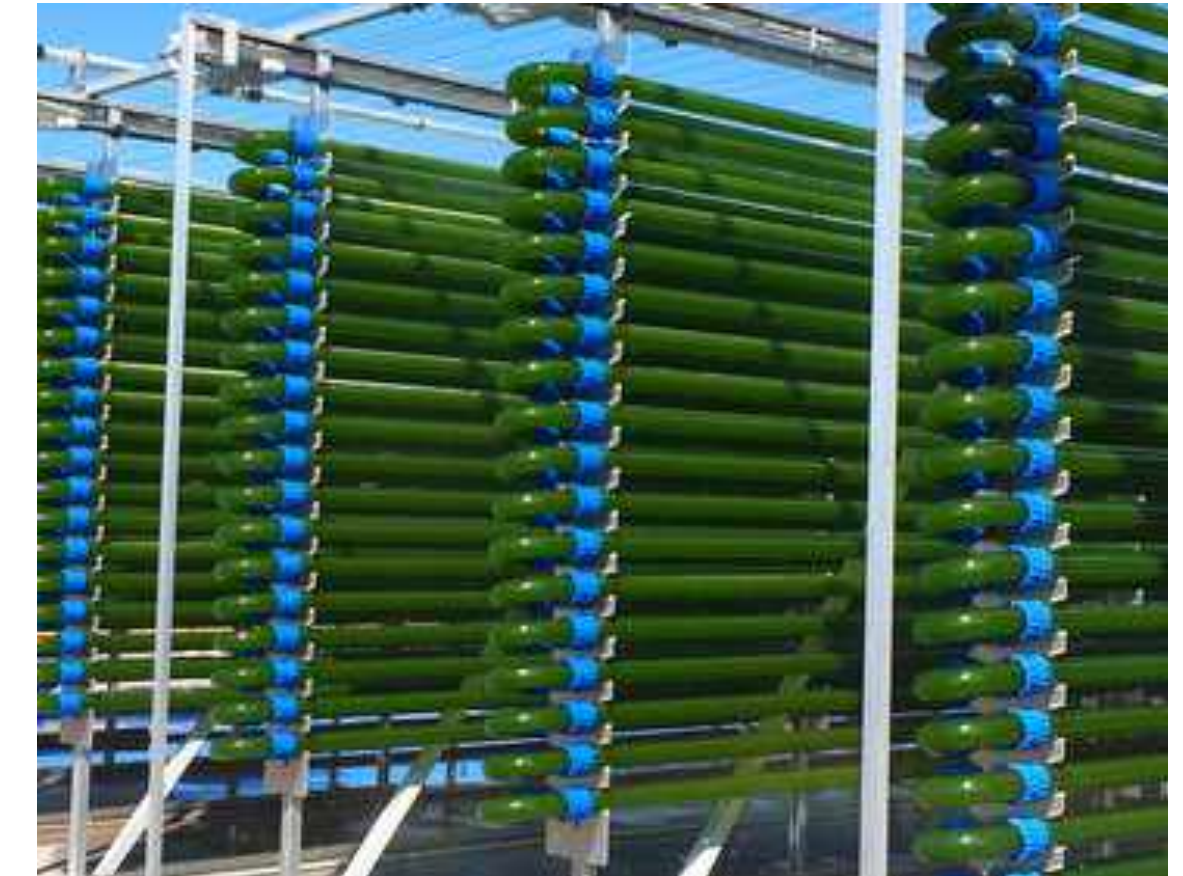
## Open air system

- Bacteria prone environment
- Huge land area required
- Production only during sunlight
- Very labour intensive
- No control of algae growth
- Manual Intensive Cleaning
- Low maintenance costs
- Production only in hot climates
- Oxygen offtake optimize
- Bacterial contamination leads to low grade



## Closed system

- Bacteria free environment
- Low biomass output
- Big land area required
- Production only during sunlight
- Labour intensive
- No control of algae growth
- Bags cannot be cleaned Thrown Away
- Costly bags replacement
- Less sunlight exposure due to algae sticking to inner surface
- Oxygen offtake insufficient which is strongly detrimental to
- algae growth



## Closed system

- Bacteria free environment
- Low biomass output
- Big Land area required
- Production only during sunlight
- Labor intensive
- Limited/basic control of algae growth
- Tubes requires cleaning, manpower/ chemical costs
- Costly tube replacement every 4th year
- Less sunlight exposure due to algae sticking to inner surface
- Oxygen offtake insufficient which is strongly detrimental to algae growth

# Spirulina Cultivation Systems History

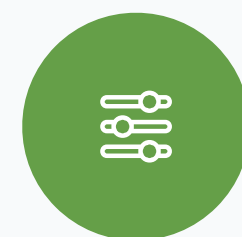
All the previous systems grow algae but fail to give the end user "YOU" clean high grade Spirulina with the required compounds that you desire to maintain optimum health. Why?



They all use sun to grow algae. None of these systems has any control to enhance the algae components

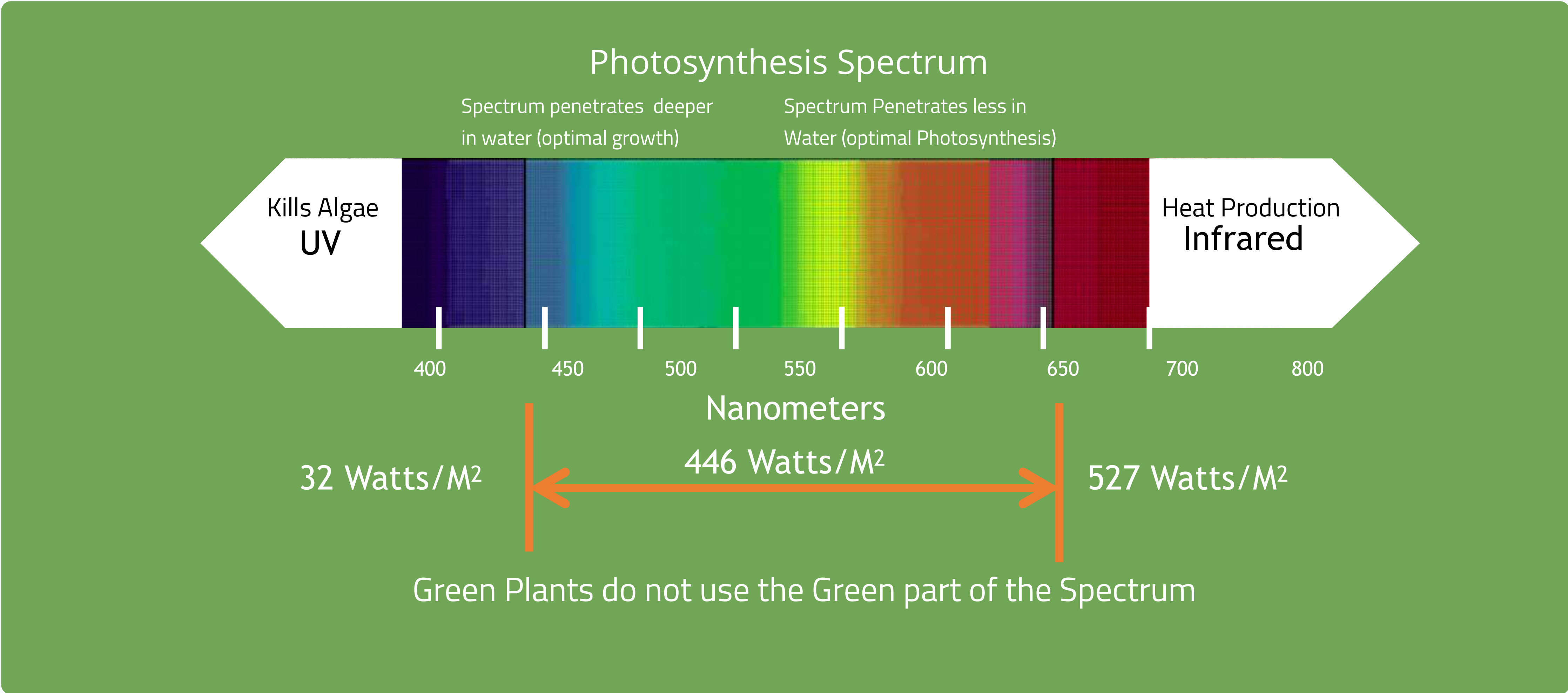


The algae does not get the required nutrients when it needs them. Temperature changes due to day and night cycle



All living cells have the ability to give feedback. Only a computer can interpret what a cell needs

# Example of using outside systems and Sunlight to grow algae and why they fail

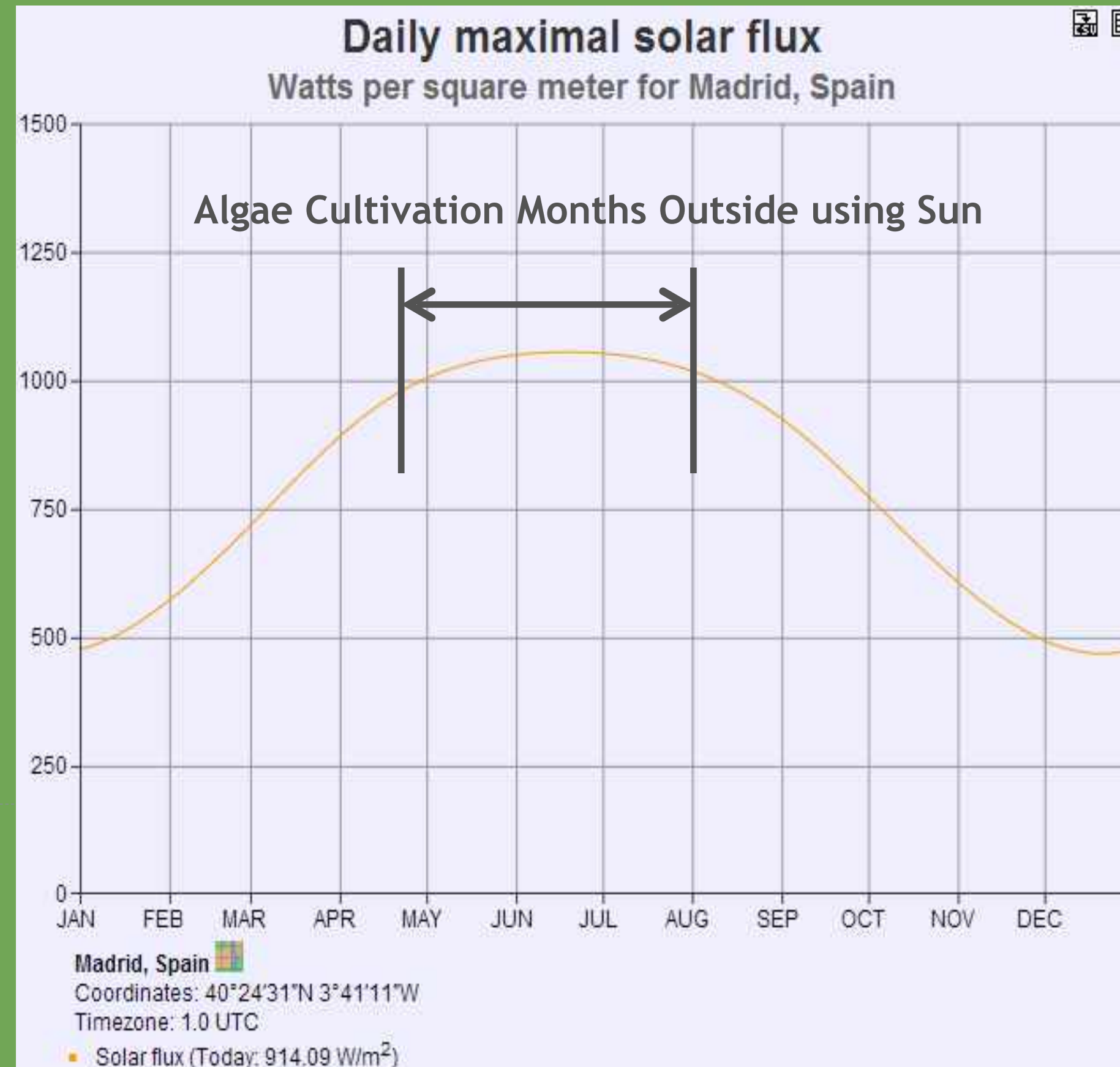


**NO CONTROL OF PATHOGENS IN THE AIR**

The result of Outside systems is High yield of biomass with low quality Spirulina due to growing only in Summer months

Jan-May

What do they grow Between Jan – May?

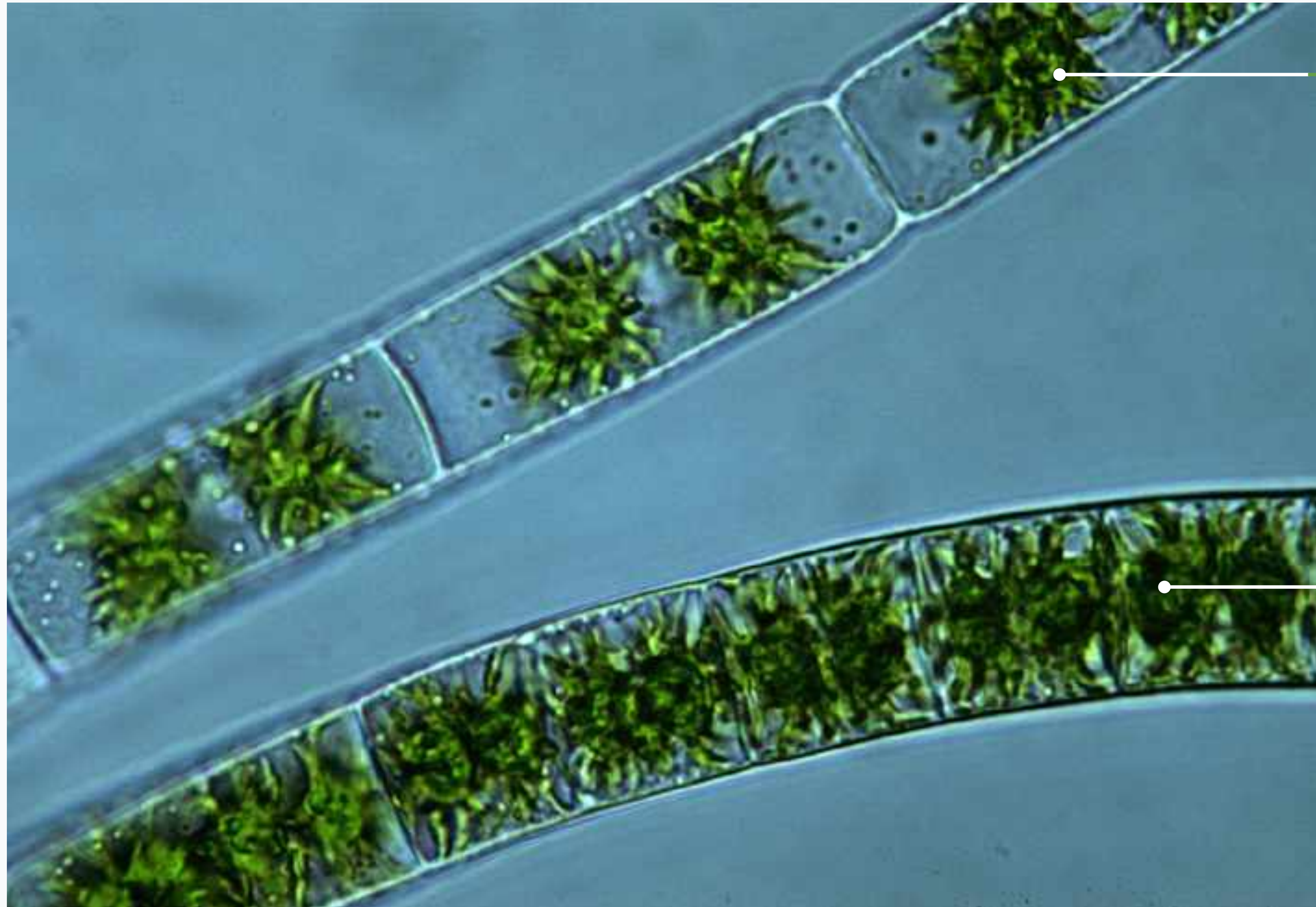


Aug-Dec

What do they grow Between Aug – Dec?

Results in low grade standard Spirulina

## Low Grade Spirulina production = Pathogens



Contaminated  
Spirulina Maxima

Uncontaminated  
Spirulina Maxima

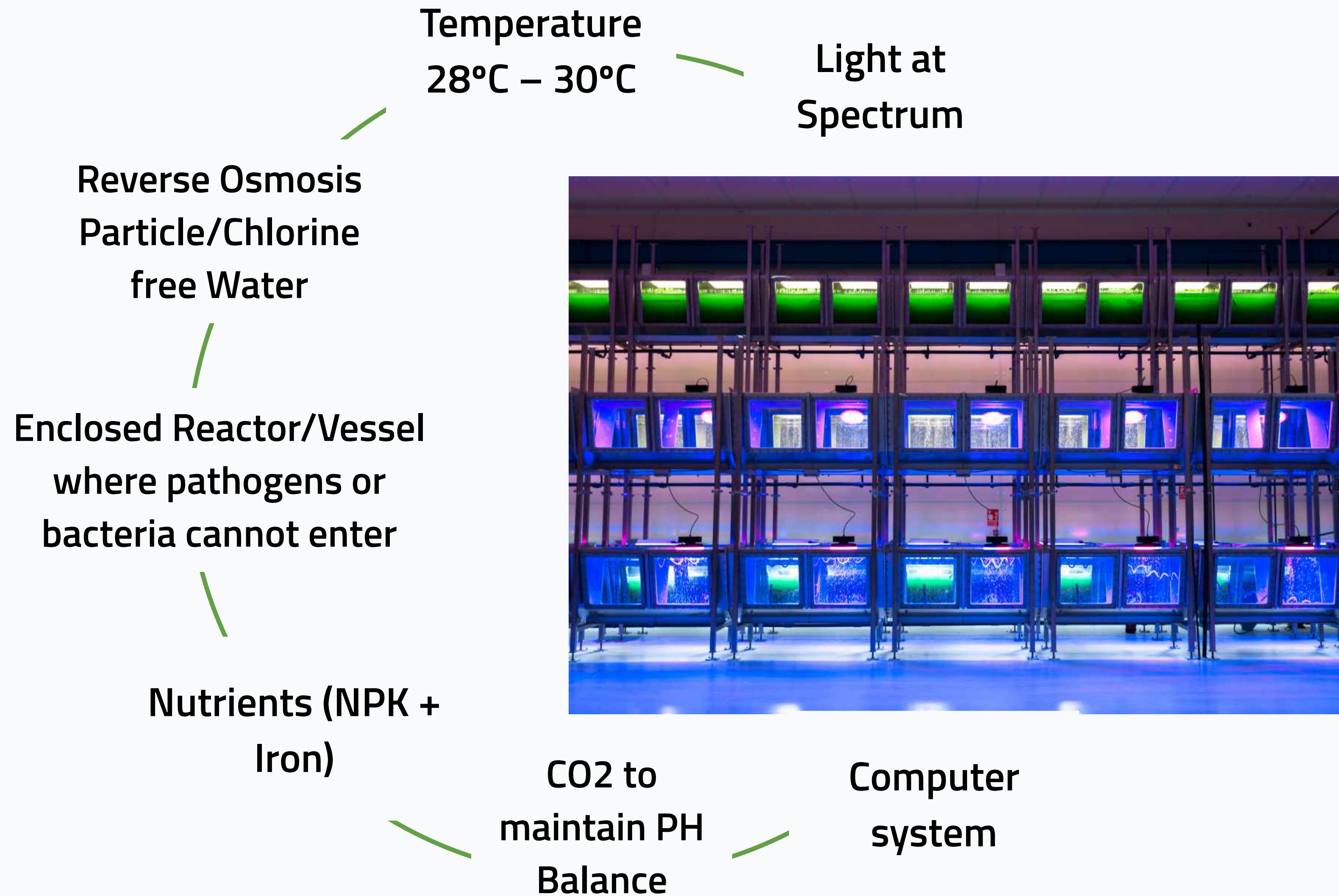


With all that we have learnt from previous systems

We have a global patent covering the following:

- Use of LED Light Spectrums
- Nutrient Injection when algae needs it
- pH Control
- Temperature Control
- Computer Control to adjust what application is required

# Main Components for High Grade Spirulina production



Spirulina  
Grown with  
high Bio  
availability

Our technology allows us to adjust these parameters in real time. We are able to grow the bio-compounds that we need.



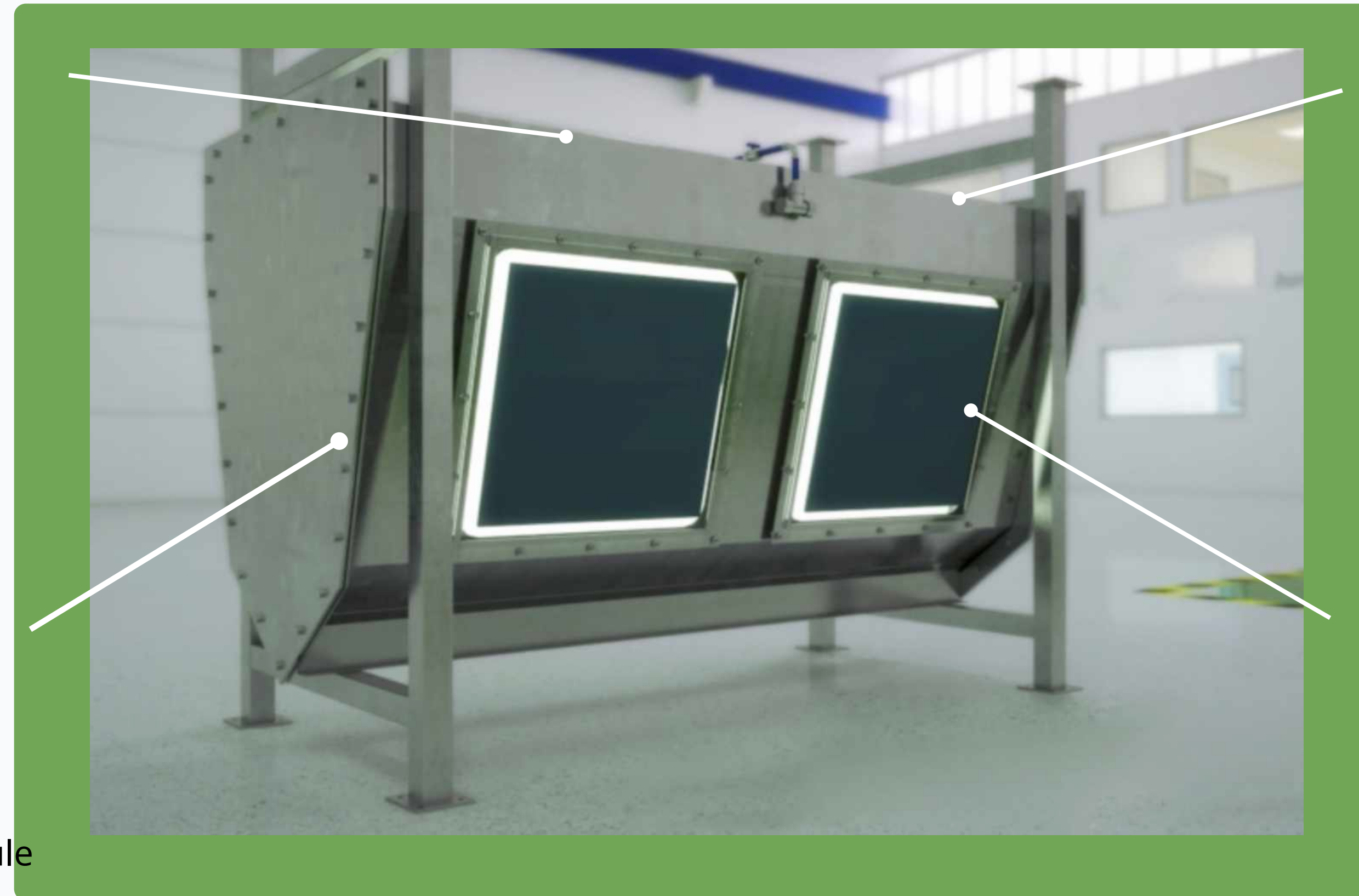
# The Technology (reactor)– The first intelligent system

## CO2/Air

Electro-Valve CO2 Sparging  
through air system  
Air Pressurising the  
bioreactor to 20 PA

## Bioreactor Chassis

316 Stainless Steel  
cGMP/HACCP Approved Material  
20 Year Life Span  
45 Sections to make 1X 90 Lm Module



## SENSOR/ AUX Input

Middle of Bioreactor 2" hole to  
allow for sensors to be push  
down into bioreactor. Bespoke  
Seal made.

## Lighting

LED Focus Lighting  
9:1 Power ratio  
Dimmable as Algae Scales  
120 Watts : 0 - 4000 PAR  
Normal Running 1000 PAR  
Spectrum 420nm - 780nm

# How it works, as easy as 123

1

**Natura4ever  
requested what  
to produce**

Phycocyanin, High Iron,  
High Vitamins, Beta  
Carotene...)

2



**Laboratory makes nutrient  
mix for production from  
online database**

3



**Computer maintains  
all parameters and  
makes analysis at  
speeds of 400GH**

- System fills with Osmosis water (No Particles and Chlorine free)
- System Adjusts Light Spectrum for Production
- System adjusts Temperature range
- System adjusts PH of Water with CO2 injection
- Nutrients are dosed
- Spirulina Is inoculated

## Results of The Spirulina Cell



Phycocyanin

Iron

Betacarotene