



## Algae – Primary Market Segments

1. Piggery Feed Supplement
  - ✓ Omega-3 uptake
  - ✓ Provision of essential amino acids
  - ✓ Improved livestock health
  
2. Egg-laying Poultry Supplement
  - ✓ Bioavailable carotenoids for egg yolk
  - ✓ Omega-3 uptake
  - ✓ Provision of essential amino acids
  
3. Aquaculture Feed Supplement
  - ✓ High protein diet
  - ✓ Bioavailable EPA omega-3 supply
  - ✓ Colour enhancing carotenoids

## Cost of Production

- \$2.50 per kg dry weight (whole algae)
- \$1.30 per kg with internally sourced CO<sub>2</sub>
- < \$1.00 per kg with internally sourced CO<sub>2</sub> and digestate from AD

## Productivity

- 20–30 g dry weight per m<sup>2</sup> per day
- 60-70 T per hectare per year (equiv. 15 000 L EPA-rich Omega 3 Oil)
- 73 times higher protein yield per hectare than soybean

## Cultivars

### *Nannochloropsis*

*High in Omega 3 EPA*

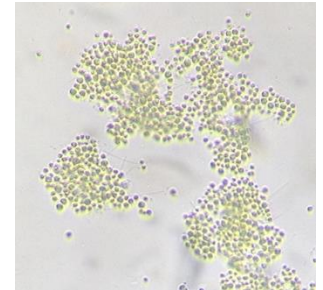
*Carotenoids*

*Protein*

*Antioxidants*

*Fast growth*

*High salinity tolerance (grows in 5-40 ppt)*



## Algae Nutrient Attributes

4-10% Omega – 3  
 30% EPA in total fatty acid  
 30-40% Protein  
 2-3% Carotenoids  
 Antioxidants  
 Vitamins  
 Minerals  
 Chlorophyll

## Benefits Over Other Protein / Omega-3 Sources

Sustainably sourced  
 Vegetarian  
 Optionally organic  
 No issues with, heavy metal or PCB accumulation





## NUTRIENT COMPOSITION of ALGAE NANNOCHLOROPSIS HIGH 0-3

Sort	Code	Name	Amount	Sort	Code	Name	Amount
00	DRYMATTER	DRY MATTER	90%	126	THREO DIG	THREONINE DIGESTIBLE	1.46%
01	C.PROTEIN	CRUDE PROTEIN	31.50%	127	TRYPT DIG	TRYPTOPHAN DIGESTIBLE	0.96%
01	NPN	EQUIVALENT CRUDE PROTEIN		128	VALINE DIG	VALINE DIGESTIBLE	1.49%
01	RDP	RUMEN DEGRADABLE PROTEIN		129	ARGININDIG	ARGININE DIGESTIBLE	1.55%
01	UDP	UNDEGRADABLE PROTEIN				HISTIDINE	0.72%
02	ADF	ACID DETERGENT FIBRE				PHENYLALANINE	2.14%
02	EFF NDF	PHYSICAL EFFECTIVE NDF				PROLINE	3.18%
02	LIGNIN	LIGNIN	0.00%	15	CALCIUM	CALCIUM	1.76%
02	NDF	NEUTRAL DETERGENT FIBRE		15	P (AVAIL)	PHOSPHORUS (AVAILABLE)	1.28%
02	NFC	NON FIBRE CARBOHYDRATES		15	P (TOTAL)	PHOSPHORUS (P TOTAL)	1.28%
02	ORG ACIDS	ORGANIC ACIDS		15	P(PHYTATE)	PHOSPHORUS (PHYTATE)	0.00%
02	SOL FIBRE	SOLUBLE FIBRE		16	CL	CHLORIDE (Cl)	2.32%
02	STARCH	STARCH	15.75%	16	K	POTASSIUM (K)	1.28%
02	SUGAR	SUGAR		16	NA	SODIUM (Na)	1.48%
03	ASH	ASH	7.88%	16	S	SULPHUR (S)	0.97%
03	FIBRE	CRUDE FIBRE	4.00%	17	DCAD	DCAD (Na+K)-(Cl+S)	
04	FAT	FAT	27%	17	MG	MAGNESIUM (Mg)	1.56%
04	FAT SAT	FAT SATURATED	5.67%	18	VIT A	VITAMIN A	<0.25 µg/g
04	FAT UNSAT	FAT UNSATURATED	21.33%	18	VIT B1	VITAMIN B1 (Thiamin)	51-70 µg/g
04	LINOLE18-2	LINOLEIC ACID C18:2n-6	0.07%	18	VIT B2	VITAMIN B2 (Riboflavin)	25-62 µg/g
04	O-3EPA-DHA	EPA C20:5n-3 & DHA C22:6n-3	12.53%	18	VIT B6	VITAMIN B6 (Pyridoxine)	3.6-9.5 µg/g
04	O-3LINLN18	alpha LINOLENIC ACID C18:3n-3	0.18%	18	VIT B12	VITAMIN B12 (Cyanocobalamin)	0.85-1.7 µg/g
04	OLEIC 18-1	OLEIC ACID C18:1	0.19%	18	VIT C	VITAMIN C (Ascorbic Acid)	1.0-3.2 µg/g
04	PALMIT16-0	PALMITIC ACID C16:0	13.50%	18	VIT D3	VITAMIN D3	<0.35 µg/g
04	STEAR18-0	STEARIC ACID C18:0	0.02%	18	VIT E	VITAMIN E	0.18-0.35 µg/g
05	D.E.PIGS	DIGES. ENERGY PIGS (MJ)		18	VIT K3	VITAMIN K3	
05	D.E.SOW	DIGES. ENERGY SOWS (MJ)		19	BIOTIN	BIOTIN	0.95-1.1 µg/g
05	M.E.DOGS	MET. ENERGY DOGS (Mcal)		19	FOLIC A	FOLIC ACID	17-26 µg/g
05	M.E.POULA	MET. ENERGY POULTRY (MJ)		19	NIACIN	NIACIN	
05	N.E.PIGS	NET ENERGY PIGS (MJ)		19	PANTACID	PANTOTHENIC ACID	
06	M.E.RUMIN	MET. ENERGY RUMINANT (MJ)		20	CHOLINE	CHOLINE	
07	N.E.L DAIR	NET ENERGY LACTATION (Mcal)		30	CO	COBALT (Co)	8.649 mg/kg
08	D.E.HORSE	DIGEST. ENERGY HORSES (MJ)		30	CO ORGANIC	COBALT ORGANIC CHELATED	
08	N.E.MAINT	NET ENERGY MAINTENANCE (Mcal)		30	CR	CHROMIUM (Cr)	0.415 mg/kg
09	N.E. GAIN	NET ENERGY OF GAIN (Mcal)		30	CU	COPPER (Cu)	115.83 mg/kg
101	LYS TOT	LYSINE (TOTAL)	2.21%	30	CU ORGANIC	COPPER ORGANIC CHELATED	
111	METH	METHIONINE	0.95%	30	FE	FERROUS IRON (Fe++)	2398.5 mg/kg
112	MET+CYS	METHIONINE PLUS CYSTINE	1.71%	30	I	IODINE (I)	
113	ISOLEUC	ISOLEUCINE	1.58%	30	MN	MANGANESE (Mn)	625.5 mg/kg
114	LEUC	LEUCINE	2.36%	30	MN ORGANIC	MANGANESE ORGANIC CHELATED	
115	THREO	THREONINE	1.73%	30	MO	MOLYBDENUM (Mo)	3.717 mg/kg
116	TRYPT	TRYPTOPHAN	1.20%	30	SE	SELENIUM (Se)	0.018 mg/kg
117	VALINE	VALINE	1.83%	30	SE ORGANIC	SELENIUM ORGANIC CHELATED	
118	ARGININE	ARGININE	2.33%	30	SI	SILICON (Si)	
12	LYS AV PIG	LYSINE AVAILABLE PIGS	1.85%	30	ZN	ZINC (Zn)	42.3 mg/kg
121	LYS DIGPLT	LYSINE DIGESTIBLE POULTRY				BETA-CAROTENE	440 mg/kg
122	METH DIG	METHIONINE DIGESTIBLE	0.79%			TRANS-VIOLAXANTHIN	1020 mg/kg
123	MET+CYSDIG	METHIONINE+CYSTINE DIGESTIBLE	1.44%			ANTHERAXANTHIN	160 mg/kg
124	ISOLEUCDIG	ISOLEUCINE DIGESTIBLE	1.32%			ASTAXANTHIN	320 mg/kg
125	LEUC DIG	LEUCINE DIGESTIBLE	1.98%				