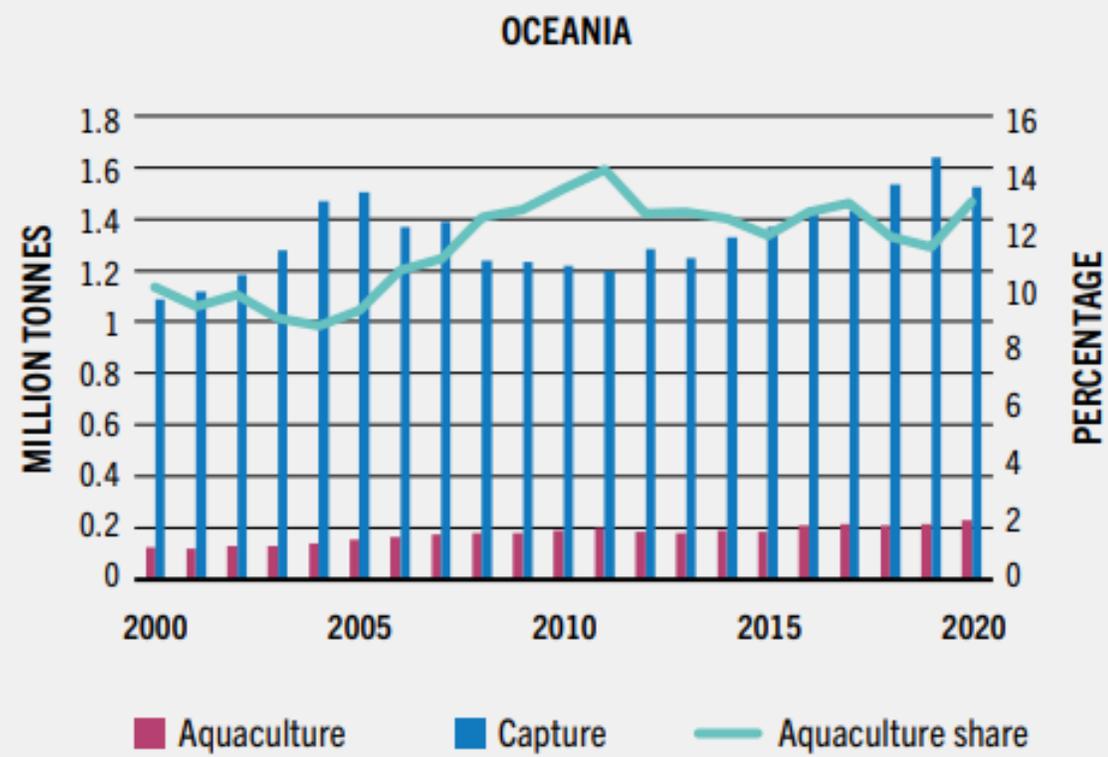
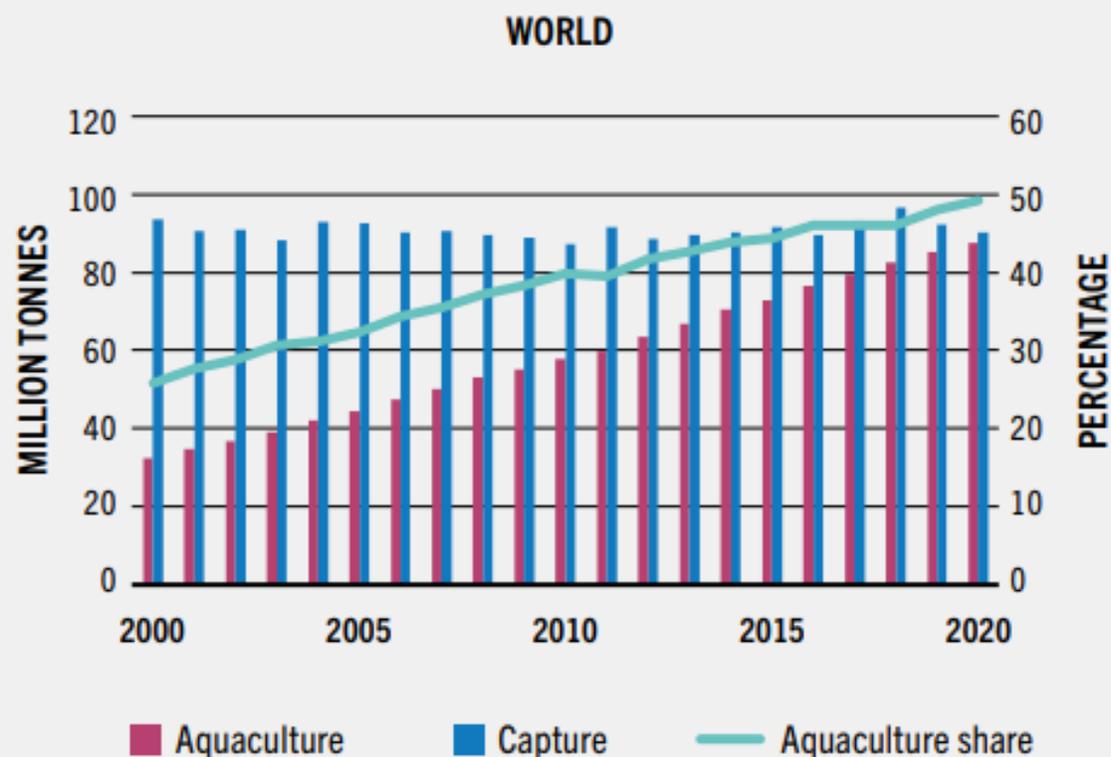
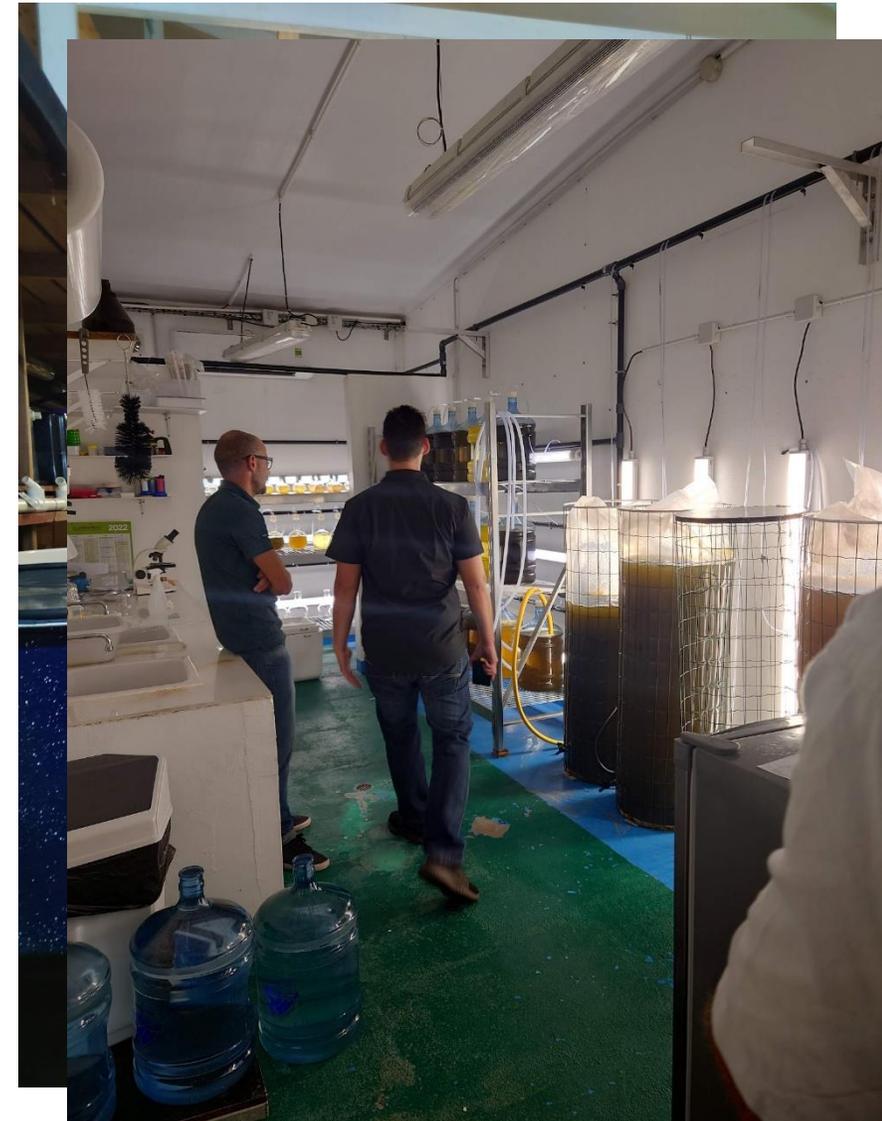


# Increased Effectiveness of Mariculture Hatchery Systems in the Pacific.

# Aquaculture Production (no seaweed)



# Capture Based / Full Cycle Aquaculture



# Mariculture (Marine) Hatcheries

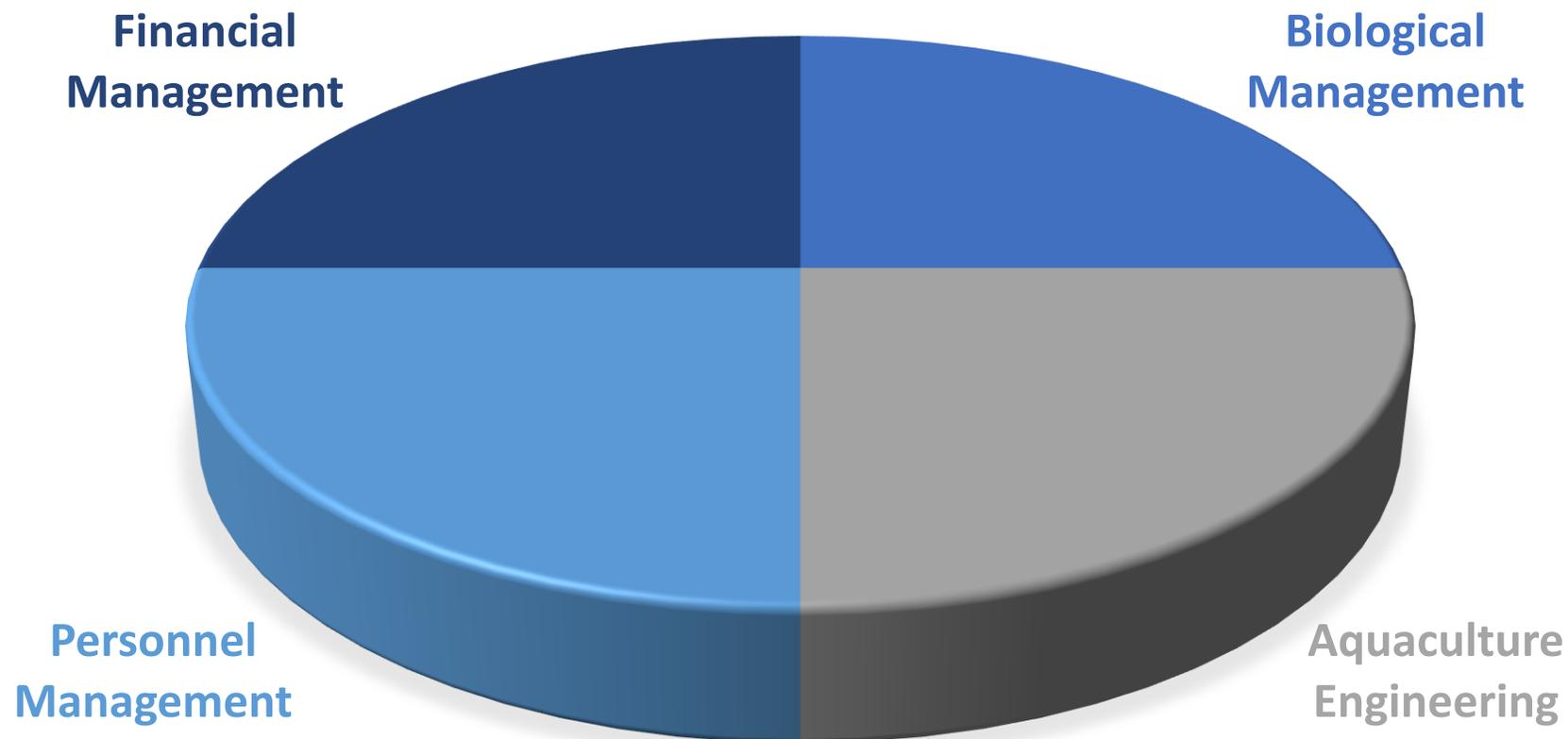


Kiribati



New Zealand

# Hatchery Management



# Larval Cycles



Giant Clams



Sea Cucumbers (BDM)



Marine Finfish

# Live Feed Production



## Premium freeze dried Chaetoceros muelleri microalgae

★★★★★ 0 REVIEWS

> €79,00 (€95,59 Incl. tax)

ChaetoPrime is Proviron's premium freeze dried Chaetoceros. Chaetoceros is an essential feed for bivalves and shrimp or prawn larviculture. It performs well in fish larviculture as a Green Water Technique. For large quantities contact us at [algae@proviron](mailto:algae@proviron)

Delivery time 2 - 5 working days (5 - 10 days outside Europe)



★★★★★ 13 reviews

### SHELLFISH DIET 1800®

Shellfish Diet 1800® is a unique mix of five marine microalgae - *Isochrysis*, *Pavlova*, *Tetraselmis*, *Thalassiosira weissflogii* & *Thalassiosira pseudonana*.

OPTIONS

1 Quart Bottle

QTY

1

\$54 - ADD TO CART

Add to Wishlist



# Live Microalgae Alternatives

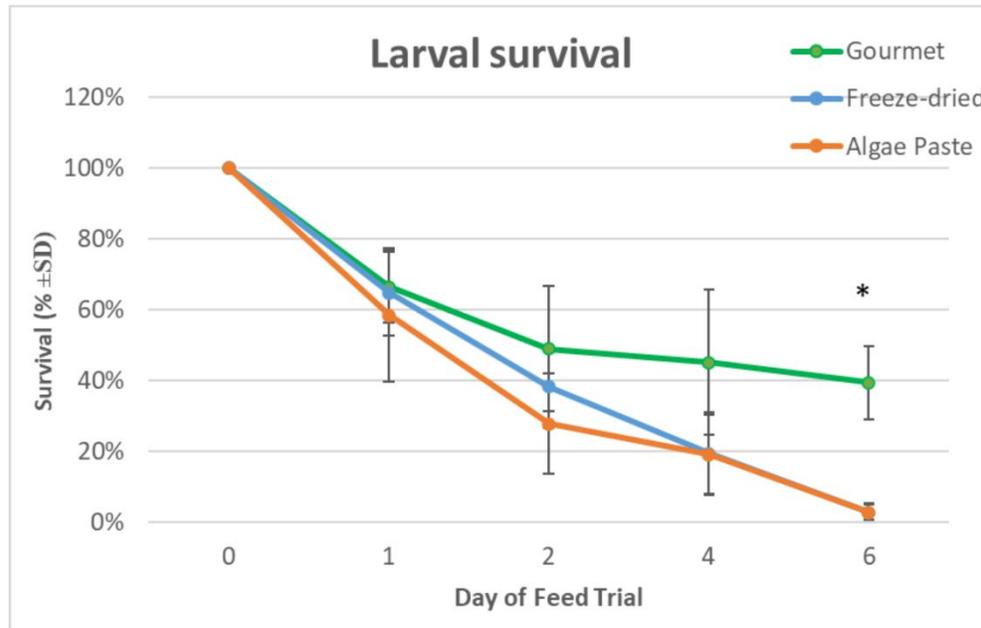


Figure 4. Greenshell™ mussel larval survival, in percent, estimated across days of the feeding trial for the three diet treatments: control/gourmet algae (blue), freeze dried algae (orange), and Algae paste (grey). Data are presented as means ( $\pm$  standard deviation,  $n = 4$ ). Day 1 of the trial corresponds to day 8PF (age of larvae), while day 6 of the trial corresponds to

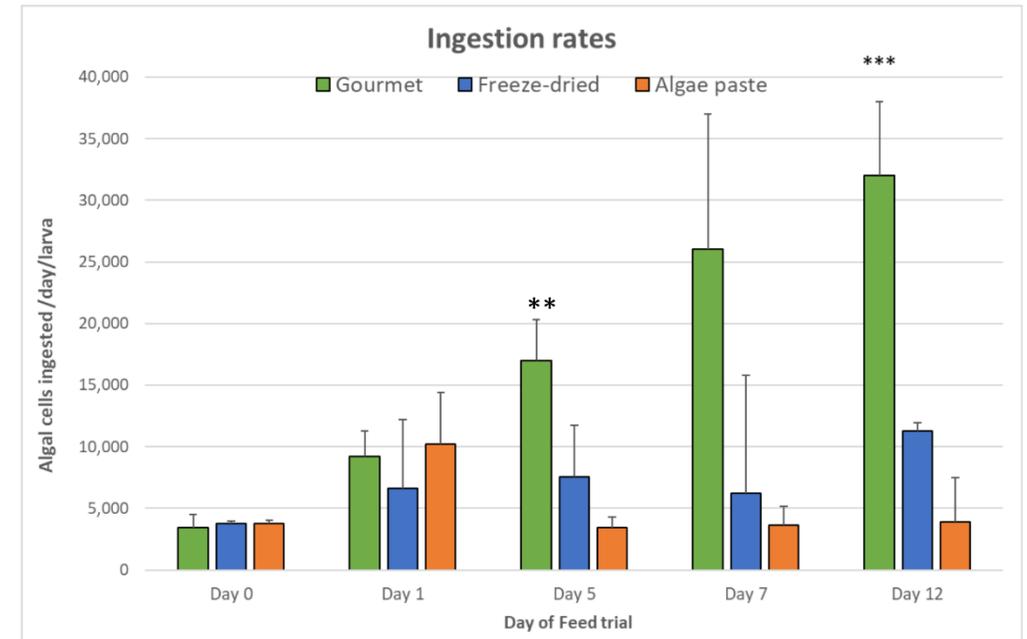


Figure 7. Mean ingestion rate of Greenshell™ mussel larvae ( $\pm$  SD,  $n = 4$ ) fed for 12 days different algal regimes consisting of gourmet algae (green), Freeze-dried (blue) and paste (orange) algae. Ingestion rates are expressed as number of algal cells ingested per larva per day. Asterisk indicates a significant difference between the control treatment (Gourmet) and the two feed treatments, Freeze-dried and algae paste: \*\*:  $p \leq 0.01$ ; \*\*\*:  $p \leq 0.001$  (ANOVA, Tukey post-hoc test).

# Pipe Sizing

Action

Calculate Imperial units Metric units Export Results Save Load

Calculation setup

D V q ṁ ρ T Liquid Gas Round pipe Rectangular channel

Flow rates and velocity

volume flow rate (q)  
6.0 m<sup>3</sup>/hour

mass flow rate (ṁ)  
6000.0 kg/hour

velocity (V)  
1.5 m/s

Pipe dimensions

pipe diameter (D)  
37.61 mm

cross section area (A)  
1111.0 mm<sup>2</sup>

Fluid properties

density (ρ)  
1000.0 kg/m<sup>3</sup>

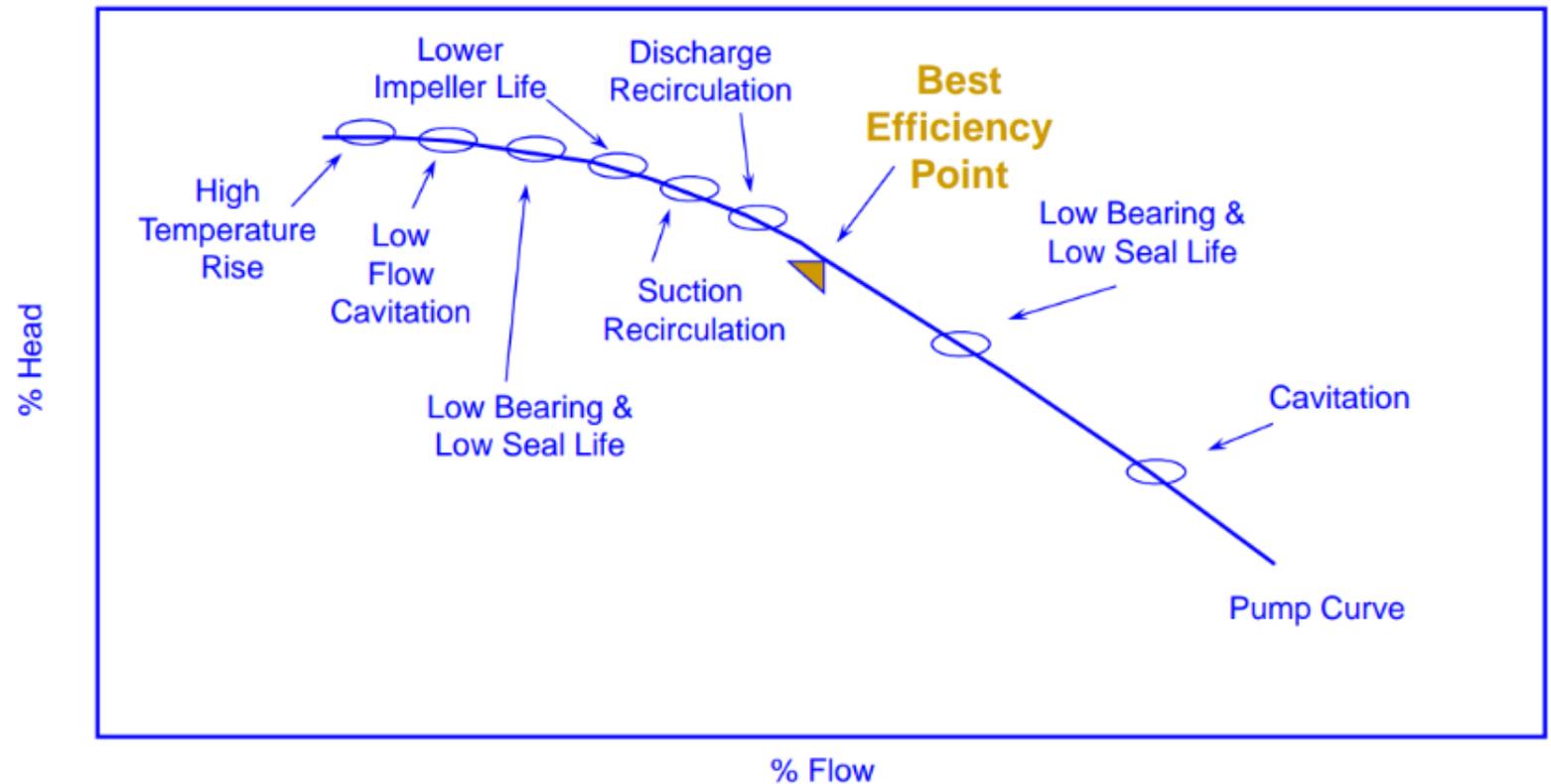


<https://www.pipeflowcalculations.com/flowrate/calculator.xhtml>

# 10 Ways to Murder your pump

1. Starved to Death
2. Worked to Death
3. Beat to Death
4. Too much Stress
5. Marriage
6. Drowning
7. Boiled to Death
8. Poisoned
9. Shake to Death
10. Neglect

## PUMP RELIABILITY - BEST PRACTICE



# Rotating Shifts

## 4-3 schedule

Team	Days 1-7							Days 8-14							Days 15-21							
Team 1		1st	1st	1st	1st			2nd	2nd	2nd	2nd			3rd	3rd	3rd	3rd					
Team 2	3rd				1st	1st	1st	1st				2nd	2nd	2nd	2nd						3rd	3rd
Team 3		3rd	3rd	3rd	3rd			1st	1st	1st	1st			2nd	2nd	2nd	2nd					
Team 4	2nd				3rd	3rd	3rd	3rd				1st	1st	1st	1st						2nd	2nd
Team 5		2nd	2nd	2nd	2nd			3rd	3rd	3rd	3rd			1st	1st	1st	1st					
Team 6	3rd				2nd	2nd	2nd	2nd				3rd	3rd	3rd	3rd						1st	1st

Shifts   1st Shift   2nd Shift   3rd Shift



# Standard Operating Procedures SOPs

Number	Description	Category	Team
1	Cleaning of intake pump station	SW System	Workshop
2	Check Seawater System Operation	SW System	Workshop
3	Filtered SW Filter bag changes	SW System	Workshop
4	Addition of Marine Organics to Broodstock Pond (feeding broodstock)	Broodstock	Nursery
5	Operation of Indoor Hatchery Seawater System	SW System	Hatchery
6	Cleaning and Disinfection of Hatchery Areas	Biosecurity	Hatchery
7	Preparation of Diets and Feeding of BDM larvae	Larval Culture	Hatchery
8	Changing of Primary Submersible Pump	SW System	Workshop
9	Fault Correction of Primary Seawater System (restarting)	SW System	Workshop
10	Fault Correction of Secondary / Transfer Seawater System	SW System	Workshop
11	Water exchange of BDM Larval Cultures	Larval Culture	Hatchery
12	Preparation of settlement plates for BDM Juveniles	Nursery Culture	Nursery
13	Spawning of BDM broodstock	Broodstock	Nursery
14	Weight Checking of BDM broodstock	Broodstock	Nursery
15	Cleaning of Giant Clam Nursery tanks	Nursery Culture	Nursery
16	Addition of Nutrients to Giant Clam Nursery Tanks	Nursery Culture	Nursery
17	Cleaning and disinfection of hatchery equipment	Biosecurity	Hatchery
18	Changing of footbaths	Biosecurity	Hatchery
19	Cleaning of primary sw system Radial Flow Separators	SW System	Workshop
20	Checks required after power outage	Facility	Workshop
21	Flow adjustment for primary seawater system	SW System	Workshop
22	Operation of open sand filter	SW System	Workshop
23	Operation of U.V. reactor for larval cultures	Larval Culture	Hatchery
24	Changing of intake filters for aeration blowers	Facility	Workshop
25	Operation of workshop tools	Workshop	Workshop
26	Checks for Biocycle wastewater system	Facility	Workshop
27	Checks and maintenance scheduling for operation of NIMRF reconditioners	Facility	Workshop
28	SOPs for all laboratory equipment	Laboratory	Laboratory
29	Checks for NIMRF freshwater systems	Facility	Workshop
30	Cleaning of NIMRF sedimentation tank and drainage channel	SW System	Workshop
...	...	...	...



# OPEX Budgets

Operational Item	Category	Components	Quantity	Unit	Unit Cost FJD	Total
fuel and oil	consumables	vehicle, vessel	300	liter	\$ 2.00	\$ 600.00
boat	consumables	work boat service	1	hour hire pa	\$ 50.00	\$ 50.00
phone (domestic and mobile)	admin	for management and operational management	0	monthly plan data + phone	\$ 25.00	\$ -
				domestic bus , 3 days		
domestic travel (related to business)	admin	domestic operations	1	subsistence	\$ 400.00	\$ 400.00
Other insurances	Admin	stock insurance	0	policy	\$ 3,000.00	\$ -
marine lease	Admin	n/a	0	lease	\$ 1,000.00	\$ -
Licences and Permits	Admin	as per Government of Fiji	1	liscense / permit	\$ 300.00	\$ -
gloves, brushes	consumables	triannual replacement per harvest / grading labor	12	set	\$ 10.00	\$ 120.00
plastic tubs	hardware	yearly replacment per harvest / grading labor	6	set	\$ 100.00	\$ 600.00
buckets	Hardware	yearly replacement	6	piece	\$ 30.00	\$ 180.00
from Labour OPEX	labour	collective	860	day per cycle	\$ -	\$ 28,896.00
CTN	consumables	ropes	1250	m	\$ 2.00	\$ 2,500
spat	product	spat collector w spat @ 200 spat m	3000	m	\$ 16.35	\$ 49,050.00
<b>Total Operations Marine Farm per 18 month Cycle</b>						<b>\$ 82,396.00</b>
				OPEX subtotals annualised		
				management & labour & admin		\$ 19,264.00
				spat		\$ 32,700.00
				equipment / consumables		\$ 2,700.00
				OPEX annualised		\$ 54,930.67

# OPEX Budgets Labour

Labour per production cycle	3000m per farm		8hours per work day 18months per cycle			FJD 2.80per hour			
	units	days	frequency	pax	Total hours	Cost	Approximate pay per job scope		
Stocking of farm per 1000m	3	3	1	5	360	FJD 1,008.00	FJD 11.20	per person per month	
Farm inspection (monthly)	1	1	18	3	432	FJD 1,209.60	FJD 22.40	per person per month	
Adding floats and levelling (once every 3 months)	1	1	6	5	240	FJD 672.00	FJD 7.47	per person per month	
1st thinning and CTN per 100m (6 months from installation)	30	1.5	1	10	3,600	FJD 10,080.00	FJD 56.00	per person per month	
2nd thinning and CTN per 100m (12 months from installation)	30	1.5	1	10	3,600	FJD 10,080.00	FJD 56.00	per person per month	
Harvesting from farm per 1000m (18 months from installation)	3	3	1	5	360	FJD 1,008.00	FJD 11.20	per person per month	
Administration (Payroll, Purchasing, H&S)	1	3	18	2	864	FJD 2,419.20	FJD 67.20	per person per month	
Farm management	1	3	18	2	864	FJD 2,419.20	FJD 67.20	per person per month	
<b>Total labour per 18-month cycle</b>		#REF!			10,320	FJD 28,896.00			
<b>Total labour per annum</b>		860		42	6,880	FJD 19,264.00	FJD 458.67	pay per person per year (average)	
							FJD 38.22	pay per person per month (average)	
<b>Yield from Spat Rope and from CTN</b>							20.48	days of work a year per person (average)	
		Oysters on spat collector		CTN Oysters		Total			
		Units	Weight (kg)	Units	Weight (kg)	Units	Weight (kg)		
Optimistic		75	6	50	4	125	10		
Average		62	4.96	35	2.8	97	7.76		
Pessimistic		50	4	25	2	75	6		

Super Merci