



THE SUCCESSFUL HISTORY OF *L. VANNAMEI* IN INDIA: From Production to International Market

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Global farmed shrimp production



A B C C C



Shrimp Aquaculture by Major Producing Regions: 2011 – 2018

Million MT

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Sources: FAO (2016) for 2011; FAO (2016) and GOAL (2014) for 2012-2014; GOAL (2016) for 2014-2018.

Southeast Asia includes Thailand, Vietnam, Indonesia, Bangladesh, Malaysia, Philippines, Myanmar and Taiwan. *M. rosenbergii* is not included.







Shrimp Aquaculture in Asia: 2011-2014 vs. 2014-2018



Sources: FAO (2016) for 2011; FAO (2016) and GOAL (2014) for 2012-2014; GOAL (2016) for 2014-2018. *M. rosenbergii* is not included.





World Shrimp Aquaculture (including *M. rosenbergii*) by Species: 1995 - 2018



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Sources: FAO (2016) for 1995-2011; FAO (2016) and GOAL (2014) for 2012-2014; GOAL (2016) for 2014-2018.







SHRIMP FARMING POTENTIAL IN INDIA

- India has 8,118 km of coast line
- 1.24 million ha of brackish water area
- Has 1,190,000 ha of potential shrimp farming area
- Total shrimp farming area is over 200,000 ha with an average growth of 20% in recent years







INTRODUCTION OF L. vannamei in INDIA



- Pilot scale introduction of *L. vannamei* was initiated in 2003 for risk analysis in India
- Coastal Aquaculture Authority of India (CAA) was authorized to grant permission to import SPF broodstock in 2008
- Large scale import of SPF broodstock was implemented in 2009
- All imported *vannamei* undergo strict quarantine procedures at Rajive Ghandi Centre for Aquaculture (RGCA)
- The only shrimp species currently refined and elevated biotechnologically to dictate the world of shrimp farming.













Present production trend in India

Year	Vannamei	Monodon	Total
2014	347,800	50,000	401,100
2015	336,000	27,450	363,450
2016	403,000	21,000	424,000
2017	563,000	38,000	601,000
2018(estimated)	629,000	40,000	669,000



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State-wise Production Statistics (tons)

States	2017		2018 (estimated)	
	P. vannamei	P. monodon	P. vannamei	P. monodon
Andhra Pradesh	346,000	7,000	390,000	7,000
West Bengal	60,000	21,000	67,000	22,000
Gujarat	55,000	0	60,000	0
Odisha	55,000	5,000	60,000	5,000
Tamil Nadu	32,000	0	36,000	0
Others (Kerala, Karnataka, Goa, Maharashtra)	15,000	5,000	16,000	6,000
TOTAL	563,000	38,000	629,000	40,000







Specific Pathogen Free

- White Spot Syndrome Virus (WSSV)
- Taura Syndrome Virus (TSV)
- Yellow Head Virus (YHV)
- IHHN Virus (IHHNV)
- MBV
- BP/MBV
- HPV
- NHP
- Gregarines
- Microsporidians
- Haplosporidians





ADVANTAGES OF VANNAMEI



- Availability of disease free and better growth stock through SPF. SPR is also available for any single virus
- Rapid growth rate faster than *P. monodon* till 20 gm
- Better survival not less than 80 % in farming
- Lesser input cost low protein feed and less chemicals
- Tolerant to wide range of salinities and temperatures
- Amenable to inland culture and relatively easy to culture, once we understand *vannamei* properly
- Better disease resistant (loose shell, white gut)
- An easy domestication and genetic selection for favorable traits such as fast growth, disease resistance and rapid maturation





Common misconception about vannamei



- Once the farm is diseased, cannot crop again for many years and tiger will not grow at all
- Are resistant to WSSV
- Grow best in cold weather
- Good for poly culture with monodon
- SPF / SPR means for life time guaranty and cannot catch diseases
- SPR means resistant to all viruses
- Only suitable for intensive cultivation





Comparison between *L.vannamei* and *P.monodon*



L.vannamei	P.monodon	
Availability of SPF brood stock	Depending on wild brood stock maximum infected with WSSV,IHHNV & MBV	
Faster growth rate. Asia's commercial growth typically 1.0 –1.5g./wk even with 60 –150 pcs/m2	Currently P.monodon growth rate has come down from 1.2-1.0 in Asia	
Easy to culture in very high densities typically 60-150 pcs/m2 even up to 400 pcs/m2.	Not practically feasible with such densities	





Comparison continued



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Tolerant to 0-45ppt salinity	In low salinities farming is not that successful
Tolerant to low temperature upto 18ºc	Culture is more problematic in cold season.
Lower protein requirement 20-35%	Protein requirement36-42%
Higher survival 50-60% in hatcheries and 80-95% in grow-out	Survival 20 – 30% in hatcheries and 40 – 60% in grow-out.



Comparison contd.



Better FCR 1.2-1.5	FCR varies from 1.5-2.0
Better meat yield in processing 66-68%	Meat yield 62% without loose shell
Less production cost 100 – 120 Rs/Kg for 20-25g.	Production cost 150-200 Rs./Kg for 25g.







Present production trend in India

- After the introduction of *L.vannamei* into India, the total culture scenario has changed drastically.
- Farmers are able to increase their production into 2-4 folds.
- Currently in India more than 95% of the farms have been converted to produce *L.vannamei*
- Initially there were difficulties in growing *vannamei* to bigger sizes, presently this has been overcome by higher growth strains and 30-35g size under high stocking densities is achievable







POND PREPARATION & PRODUCTION





WATER INTAKE AND FILTRATION









































































































Biosecure Zero Exchange System













HATCHERY REGULATIONS IMPLEMENTED BY CAA



- Approval of the facility for rearing SPF *vannamei* is granted by CAA only after due inspection of the facility
- Hatcheries should have been registered under the provisions of CAA act, 2005
- Hatcheries should have required bio-security facilities such as fencing, vehicle/tyre baths, foot wash, hand wash etc.
- There should be a PCR laboratory with the required kits and reagents with a qualified laboratory technician
- Effluent Treatment System (ETS) should be functional in the hatcheries
- After CAA approval the hatcheries should get Sanitary Import Permit (SIP) from the dept. of Animal Husbandry







No. Of Hatcheries Importing Broodstock in India









NO. OF BROOD STOCK PRODUCTION IN INDIA









Seed Productionn In India (billions)








Gut Probiotic and Feed Additives







Feed additives Exorich Growth promoter and immunity enhancer Wibrio controller and gut immunizer Stress reliever, molting inducer and metabolism manager









- Intestinal health is the key for overall growth and well-being of the animal
- Gut is the primary organ of nutrient metabolism and hub for microbes as well
- Better the nutrient assimilation, better the growth of the animal and success of the crop







Characteristics of Ecoforce strains

- Produces organic acids and thus decrease intestinal pH, thereby inhibiting the proliferation of pathogenic bacteria
- Survive intestinal barrier
- Heat stable
- Bile stable
- Acid stable
- Produces enzymes like amylase, protease and pectinase

- Improves assimilation
- Controls vibriosis
- Controls white gut
- Controls white feces
- Prevents loose shell
- Resolves blue shell
- Ensures your crop











- Pathogenic Vibrio infestation remains as one of the major reason for mortality
- Domination of luminescent bacteria stunts growth and cause internal mortality
- Efficient strains in Novib eliminates pathogenic *Vibrio* and other pathogens in the shrimp
- Protects the crop from infection



Composition

Each 500 g contains

Bacillus subtilis ABPL 1543.5 x 10°Bacillus cereus ABPL 15512.5 x 10°Excipientsq.s









Helps immunomodulation and develops a supple exoskeleton











Restores Pond Ecosystem by Reducing the Sludge



Beneficial bacterial formulation

Bioremediation of organic waste and fecal matter to bio-fertilizers

Effective at wide range of salinities from 0 - 60 psu

Result and profit oriented

Environment friendly

Towards sustainable aquaculture







(Soil conditioner)

FOT























Importance of Aeration in *L. vannamei* Shrimp Farming & its Impact





Typical Daily Oxygen Curve for Outdoor Ponds



- More Aeration than Required—Wasting Energy
- O Just Right Aeration

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No Aeration—Stress & Possible Fishkill at Times







Propeller













Vertical pump Aerator











Air Blower













Paddlewheel aerator







3HP

















COMBINED AERATION – PADDLES & SPIRAL Wheel & Spiral













Solubility of dissolved oxygen at saturation in waters of different temperatures and salinities.









Plan Of Stocking Dépends on Wheel Density 20-200 /m2



Salinity in ppt	No of PL/Wheel
Below 15	7000
15-20	6500
20-25	6000
25-30	5500
30-35	5000
35-40	4500
40-45	4000
45-50	3500









Save Power...!

Save Money..?



100 HP power facility farm

Aerator Type	2 HP Aerator	3 HP Aerator
No of Aerators	50 Aerators	33 Aerators
Total wheels	50 x 4 = 200	33 x 16 = 528
Stocking PLs as per wheels	200 x 6000 = 1,200,000	528 x 6000 = 3,168,000
Biomass as on Survival 80% ABW 30g	960,000 x 30g = 29MT	2,534,400 x 30 gm =76 MT







TIPS...

* D.O level should be maintained not less than 4ppm at bottom .

* Mix of paddle wheel and spiral increases the D.O level comparatively.

* Don't fix aerators in around centre of the pond.

* Spiral produce more O2 compared to paddle wheels.









Feed Production Status







India has an installed capacity of over 2 million tons of feed

Feed production crossed one million tons in 2017

Every year one or two new feed mills are set up to cope up with the demand and to reduce feed imports







Feed Management







Recommended nutrient levels for shrimp feed on percentage fed basis

Shrimp size (gm)	Protein (%)	Fat (%)	Fiber (%)	Ash (%)	Moisture (%)	Calcium (%)	Phosphor us (%)
0.0-0.5	45	7.5	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5
0.5-3.0	40	6.7	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5
3.0-15.0	38	6.3	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5
15.0-40.0	36	6.0	Max.4	Max.15	Max.12	Max.2.3	Min. 1.5





Feeding schedule



TIME	FEEDING %	DOC	ABW in grams	Check tray feed Gram / kg	Observation Hours.
7:00 AM	27%	1-24	2 >	2	3.5
11:00 AM 2		25-35	2 -4	3	3
	25%	36-50	4 - 7	3.5	2.5
3:00 PM 28%	51-70	7 -14	4	2	
	_0,0	71-90	14 -20	4.5	2
7:00 PM	20%	91 <	20 <	5	1.5





Right choice...



* Tray size should be square 80cm X 80cm and 5cm height.

*Put the tray into the pond at the 10th day of stocking.















Daily feeding chart



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¥ESshrimps						
Stocking	Feed Management	Sampling Report	Water Quality	Chart	Harvest	Finance
User Login tech		Farm Name Location	Meenam Aqua Farm Yanam , ,		Contact Person Anjaneyulu K Consultant Name Jc Srinivasan K	Ph 7799660076 Ph 9703331188



Shrimp Farming Software





















SHRIMP MARKET & MARKETING STRATEGIES





PROCESSING FACTORIES

- There are 344 EU approved processing plants
- Processing units are approved by the Export Inspection Council of India
- Approval types are those units which are eligible to export to EU and those units which are eligible to export to countries other than EU





Year	2013-14	2014-15	2015-16
Volume - Metric tons	301,435	357,500	373,866
Value - Billion US\$	3.21	3.71	3.10
Value of total sea food exported from India – Billion US\$	5.00	5.51	4.69
% share Value of frozen shrimps	64%	67%	66%

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YEAR	2013	2014	2015	2016	2017
Total shrimp to USA	504,608	567,673	585,826	603,591	604,338
Shrimp from India	90,983	108,651	135,352	153,984	194,983
India's share % of total imports	18%	19%	23%	25%	32%







Top 14 US shrimp import sources by volume, August 2018

COUNTRY NAME	2018 AUGUST	2017 AUGUST	% CHANGE	2018 JAN-AUG	2017 JAN-AUG	% CHANGE
	METRI	C TONS		METRI	C TONS	
INDIA	25,888	22,845	13%	150,841	129,040	17%
INDONESIA	11,366	8,449	34%	86,651	75,415	15%
ECUADOR	8,571	5,969	44%	51,478	49,865	3%
VIETNAM	6,113	6,003	2%	32,055	34,149	-6%
CHINA	5,705	5,282	8%	29,918	29,699	1%
THAILAND	3,358	7,489	-55%	28,158	44,642	-47%
MEXICO	1,033	1,732	-40%	9,454	9,946	-5%
PERU	978	697	40%	7,358	7,485	-2%
ARGENTINA	937	870	8%	6,836	7,467	-8%
HONDURAS	767	369	108%	5,222	2,434	115%
NICARAGUA	427	214	100%	1,791	1,030	74%
PANAMA	421	326	29%	1,840	1,363	35%
VENEZUELA	296	220	35%	2,162	1,387	56%
GUYANA	270	604	-55%	6,006	7,815	-23%
TOTAL	66,843	61,918	8%	425,339	408,967	4%















INTRODUCTION OF L. vannamei IN INDIA HAS ELEVATED THE SHRIMP PRODUCTION AS WELL AS PAVED THE WAY FOR TO ENHANCE FOR HEN EXCHANGE THANK YOU

