

FARM BIOSECURITY

INFORMATION & IMPLEMENTATION

VIRAL (WSSV) DISEASE

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January 2009**

Biosecurity

The success or failure in shrimp farming is how successful one can prevent and control the viral (mainly WSSV) out breaks.

Most locations are not viral free – one must be able to farm shrimp amid viral threats.

The information given emphasis on how the WSSV is to be controlled by bio-secured module design and operation system.

IMPORTANT POINTS TO FOLLOW

1. **BIO-SECURITY ? (CORRECT DEFINITION)**
2. **KNOW YOUR ENEMY ! (INFORMATION)**
3. **PREVENTIVE MEASURES ? (INFORMATION)**
4. **IMPLEMENT ! (DO IT)**
5. **TIMELY (ON TIME)**
6. **STRICT DISCIPLINE (NO EXCEPTIONS)**
7. **BE SERIOUS (BETTER SAFE THAN SORRY)**

Farm Biosecurity - Factors

Farming Technology

Reservoir system – module with quarantine & treatment ponds

SPF Broodstock

Use SPF broodstock from certified Nucleus Breeding Center (NBC)

SPF Post Larvae (PL)

Healthy PLs from hatchery which use NBC broodstock

Pond Construction

HDPE lined ponds
Semi-lined ponds
Earthen ponds

Water borne

Crustaceans; Free living WSSV in water; human and equipments.

Air borne

Birds pickup infected dead or live shrimp and drops into culture ponds; Human ?

Land borne

Carriers – crustaceans crabs, human, domestic and wild animals, etc

Farm Management

Follow strict biosecurity on the management system

Environmental stress

Minimize stress on shrimp in ponds. Application of feeds, treatment of pond water, paddle wheels in right place and in operation, high density without appropriate energy input, etc.

Feed

Do not use fresh feed - trash fish, bivalves, etc.

Human transmission.

People involved in farming (Technicians, workers, guests, etc)

Farm Biosecurity - WSSV

Basic WSSV Characters

1. Mass mortality: DOC <45 days
2. Temperature >30 less prone; <29 more prone; <26 dangerous.
3. Onset of heavy rain (season) with low temperature trigger outbreaks.
Seasonal occurrence is well document.
4. Virus dies in free water in 72 hours
5. Crustacean are carrier (crabs) – lives with virus.
6. Virus lives in freshly dead, indefinitely in fresh processed frozen condition
7. Virus can live and survived after mortality Vannamei
8. Bacteria white patch (spots) on carapace can be mistaken as WSSV spots.

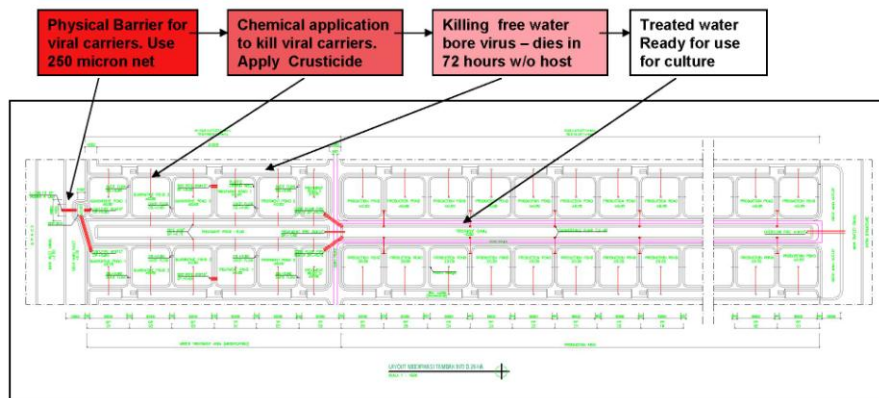
Farm Biosecurity - Implementation

1. Use SPF post larvae (PL)
2. Use reservoir module system- water treatment system, operate as SOP
3. Use bird scare lines – all in place
4. Use crab fence - all in place
5. Control workers' movement – farm/farm; module/module, row/row
6. No handling (touching) unnecessary – only person responsible can handle.
7. Minimize workers – minimum worker team: stocking, harvest, sampling.
8. Use chemical (sun drying) to disinfect all equipment– screen net, cast net, etc.
9. All equipment in operation – eg. PWAs, water pumps, siphon equipment, etc.
10. Educate people on biosecurity
11. Environmental cleanliness – Car dip, pond, water, housing, etc.
12. Control Human traffic– guest, workers, technicians, Management personal, etc.

Bio-security: Culture Operation Control WSSV



Reservoirs module system to control viral disease (WSSV)



UPDATES on WSSV (White Spot Syndrome Virus) or SEMBV
Nyan Taw – 17 September 2007

Sr.	Known Information on the WSSV (SEMBV)	References
1.	Six marine microalgae (<i>Isochrysis galbana</i> , <i>Skeletonema costatum</i> , <i>Chlorella sp.</i> , <i>Heterosigma akashiwo</i> , <i>Scrippsiella trochoidea</i> and <i>Dunaliella salina</i>), <i>Chlorella sp.</i> and <i>S. trochoidea</i> had the strongest WSSV-carrying ability. (<i>P. japonicus</i>)	Bo Liu, et al (June 2007) Chinese Academy of Sciences, Qingdao, China.
2.	Stocking at right season- Viral disease outbreak Oct-Dec during severe weather changes. Stock from Feb & March. Stock July-October second season before cold season. (Thai)	Pornleard Ch. (AAHRI Thai) November 2004
3.	Seasonal factor and crop planning to reduce WSSV (India). To stock 1 st week Feb. to 2 nd week March. WSSV prevalence from March-June (India)	FAO/NACA India, 2004
4.	WSSV virus gets into shrimp through the gut - ingesting infected tissues & that means cannibalism of infected shrimp, eating infected carriers (crab, crustacean larvae, etc.) (<i>Vtan</i>)	Kurt Klimpf (WSF 2003)
5.	Afternoon pond water temperature above 30 C reduces WSSV losses (<i>L. vannamei</i>).	Edward Seura (WSF 2002)
6.	Pond water temperature above 30 C reduces WSSV losses (<i>L. vannamei</i>).	Davis Currie (WSF 2002)
7.	Shrimp exposed to WSSV at 30 C survives but at 29 C dies (<i>L. vannamei</i>).	Edward Seura (WSF 2002)
8.	Infected shrimp resist better (stronger) at temperature 32-33 C (<i>P. monodon</i>)	Dr. Prusit (CP Indo)
9.	WSSV remain virulent in shrimp carcass for 6 days. WSSV weaken in sea water in 48 hours. (<i>P. monodon</i>)	Wang Yin-Geng, et. al. WA (2002)
10.	WSSV outbreak fast at temperatures between 23 & 28 C. (<i>P. japonicus</i>)	Guan Y, et. al, WA (2002)
11.	Massive mortalities in grow out occur – 21 and 42 days (<i>L. vannamei</i>)	Rodriguez, J. et al., WA (2002)
12.	Spawners - spawning stress triggered replication of WSSV (<i>P. monodon</i>)	Guang-Hsiung Kou & CF Lo, WA (2002)
13.	Increase survival: older PL, smaller size pond, decreased stocking density, larger shrimps at WSSV outbreak, outbreak beginning later in the production cycle, ponds using nurseries and warm season. (<i>L. vannamei</i>)	Davidson, J. et al., WA (2002).
14.	WSSV & IHNNV detected on FOO (WSSV & IHNNV free) PI under bacterial stress 20-30 days after stocking (at any PI) in the pond. (<i>L. vannamei</i> ?)	Ormaza-Gonzalez, FI, et al., WA (2002)
15.	Rapid changes in water temperature, hardness, salinity or reduced DO (<2 ppm) for extended period can trigger outbreaks of WSSV. Fresh or frozen feeds of aquatic animal origin. Wrong diagnosis with – similar BWS (Bacteria White Spot Syndrome) (International – <i>Pseuena spp.</i>)	Bondad-Reanto, M.G. et al. FAO (2001).
16.	WSSV during northeast monsoon (November to January) - heavy rains, dramatic temperature changes, and rapid shifts in water quality variables like salinity and alkalinity. West Malaysia (<i>P. monodon</i>)	Chamberlain, G., WSF (2002)
17.	By 1998 a clear pattern of the disease had set in: WSSV tended to hit during the northeast monsoon (October to January – cold & low salinity). Thailand (<i>P. monodon</i>)	Polioudakis, M., WSF(2002)
18.	The experiment seems to indicate that a soil borne source of WSSV is the primary issue in management of this virus (<i>L. vannamei</i>).	Bray, W.A. et al., WSF(2002)
19.	WSSV survive in free seawater for 72 hours, mainly attack culture age 30 to 50 days, high PL, stocking density and stress due to poor pond condition (pond bottom & water – plankton drop, low DO, etc.) triggered the attack. Sudden change of weather condition – heavy rain and low temperature. Two dominant peaks – January/ February and June/July (Java & Sumbawa). Wrong diagnosis with similar bacteria infection - white patch disease (1996) now (2001) known as BWS (Bacteria White Spot Syndrome). (<i>P. monodon</i>)	Nyan Taw, FAO/DOF (1997); WSF (2001 & 2002); AA (2001)

WA: World Aquaculture 2002 Conference, China. Published (abstracts) April 2002 ; FAO: Asian Diagnostic Guide to Aquatic animal Diseases. FAO Fishery Technical Paper 402/2. FAO Rome, 2001. FAO/DOF: Food & Agriculture Organization of the UN and Department of Fisheries. FAO Shrimp Culture Development Project Seminar in Myanmar, December 1997. WSF: World Shrimp Farming (Nos.13 & 14). Shrimp News International, San Diego, CA, USA. (Jan.'01, Jan.'02 & Nov'03). AA: Aquaculture Asia, 2001, Volume VII3. Network of Aquaculture Centers in Asia (NACA), BKK, Thailand. AAHRI: Aquatic Animal Health Research Institute Thailand. NACA: Network of Aquaculture Centers in Asia, Bangkok.

Program stocking with weather condition

SEMBV dominant (unstable weather - rainy & cool) months - Indonesia, Thailand & Malaysia																	
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
CPB Lampung																	
Java & Sumbawa																	
Thailand																	
Malaysia																	
Proposed stocking & harvest avoiding SEMBV dominant months for CP Bahari																	
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
SEMBV months																	
Propose Stock PL																	
Propose Harvest																	

Note : SEMBV = WSSV

PL QC – Documents Required before using in Farm

PT. KTU (BENUR UNGGUL)
UNIT PEMBENIHAN UDANG
 Jl. Raya Karang Bolong km 141 Anyer, Serang, Banten
 Telp/fax : (0254) 650266 / (0254) 650266, e-mail : unitbaa@yahoo.co.id

FRY QUALITY SCORING

Test Date :
 Fry Code :
 Stage :

Parameter	Result	Score
Average Length (mm)		
Standard Deviasi (mm)		
Necrosis (%)		
Ediparasite (%)		
Stress Test (Formalin 100 ppm 2 jam) (%)		

Date:
 PCR : Harvest
 *) Internal Report

1) Total Length	2) Necrosis
PL 10 : 8.0 mm	0 - 20% : 20
PL 11 : 8.5 mm	21 - 30% : 15
PL 12 : 9 mm	31 - 50% : 10
3) Size Variation/Variasi ukuran	4) Ediparasite
< 0.75 : 25	Clean : 10
0.75 - 1 : 20	5 - 10% : 5
1 - 1.5 : 15	
> 1.5 : 10	
5) Formalin Test	6) Gut to Muscle Ratio
SR 80% - 100% : 15	> 85% : 5
SR 80% - 89% : 10	70% - 84% : 3
SR 70% - 79% : 5	< 70% : 0
SR < 70% : 0	

Remarks :

Approved By: _____ Checked By: _____
QC Receiver

Technician: _____ Lab. Section: _____

DEPARTEMEN KELAUTAN DAN PERIKANAN
BALAI KARANTINA IKAN SELAPARANG
 Jln. Adi Sucipto, Bandar Udara Selaparang, Mataram - NTB 83124
 Telp. (0370) 635425 Fax. (0370) 637145
 E-mail: bks_selaparang@yahoo.co.id

Nomor Sampel : DK 048/LAB PCR/VII/2008
 Tanggal Sampel : 28 - 29 Juli 2008
 Jenis Sampel : Udang - Vannamee (*Litopenaeus vannamee*)
 Nama Pemilik : PT. Komindo Trading Utama
 Alamat Pemilik : Desa Selengen, Kab. Lombok Barat
 Jenis virus yang diperiksa : TSV, WSSV, IMNV
 Hasil Pemeriksaan : **NEGATIF TSV, NEGATIF WSSV, NEGATIF IMNV**

No.	Jenis Sampel	Organ	Hasil	Keterangan
1.	Marker	-	Jelas	
2.	Kontrol Negatif	ddH ₂ O	-	
3.	Kontrol Positif	RNA TSV	++	
4.	Sampel 048	PL	-	Negatif
5.	Kontrol Negatif	ddH ₂ O	-	
6.	Kontrol Positif	DNA WSSV	++	
7.	Sampel 048a	PL	-	Negatif
8.	Kontrol Negatif	ddH ₂ O	-	
9.	Kontrol Positif	RNA IMNV	++	
10.	Sampel 048b	PL	-	Negatif

2009.07.29 19:29
 Mataram, 29 Juli 2008
 Pemeriksa :
 1. I Putu Panca, S.Pi /080126865
 2. Sri Retnongisah, S.Pi/950002285
 3. Alfa Astiana, S.Si /950002225

Penyelia: _____ Mengetahui: _____
 Haerah, S.Pi NIP. 080126864
 Proke Jarmantani, S.Pi NIP. 080126962



Bamboo Shrimp Syndrome - recent



Thank You