



# US Marine Shrimp Farming Program

coordinated research & technology consortium

ARIZONA HAWAII LOUISIANA MASSACHUSETTS MISSISSIPPI SOUTH CAROLINA TEXAS



## INDUSTRY BULLETIN! USMSFP Clarifies SPF Standards

### SPECIFIC PATHOGEN FREE (SPF)

shrimp are part of a broader biosecurity strategy designed to minimize the introduction and spread of pathogens. The world's first population of SPF shrimp was developed by the US Marine Shrimp Farming Program (USMSFP) in 1989, and the value of SPF stocks to the shrimp farming industry is now recognized worldwide.

Despite this recognition, the SPF concept is not clearly understood by many stakeholders in the industry. The purpose of this bulletin is to educate relevant stakeholders about the SPF concept by defining what this term means and what it does not mean.

**SPF DEFINED:** An SPF shrimp is free of specified pathogens. This status changes depending on the level of biosecurity where the shrimp are maintained.



SPF shrimp are only found in a documented, disease-free Nucleus Breeding Center (NBC) such as this one at the Oceanic Institute in Hawaii.

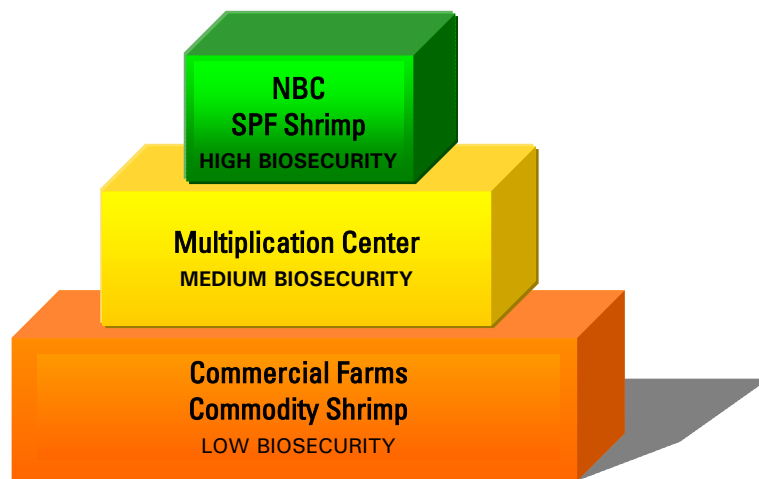
- SPF shrimp have a documented history of being free of all specified pathogens on an SPF list.
    - Broodstock suppliers may have different lists, so the specifically listed pathogens may vary.
  - To be included on an SPF list, the pathogen **MUST** be:
    - reliably diagnosed
    - physically excluded from a facility
    - a significant threat to the industry
  - SPF status depends on the level of biosecurity where the shrimp are cultured.
    - SPF designation is only for shrimp that are maintained in high biosecurity facilities, such as a Nucleus Breeding Center (NBC), where there are two or more years of documented disease testing to support their SPF status.
 

**SPF SHRIMP = HIGH BIOSECURITY**

    - SPF shrimp that are transferred from an NBC to a medium-security facility lose their SPF status.
 

**MULTIPLICATION CENTER = MEDIUM BIOSECURITY**

    - Shrimp that are transferred to low security production facilities or outdoor ponds or tanks are designated as commodity shrimp. **COMMODITY SHRIMP = LOW BIOSECURITY**
- SPF shrimp are **NOT** innately resistant to disease or infection.
  - SPF ≠ SPR (Specific Pathogen Resistant)
  - SPF shrimp can be bred for specific pathogen resistance to produce an SPF/SPR shrimp.
- SPF status is **NOT** a heritable trait.
  - SPF status can not be passed on from parent to offspring.
  - SPF status changes with the pathogen condition of the shrimp and the level of biosecurity where the shrimp are cultured.



# The truth about SPF shrimp ...

UNDERSTAND THE VALUE ...

SEEK PROPER VERIFICATION.

## The GOLD STANDARD for SPF Stocks

### THE USMSFP LIST OF PATHOGENS & DISEASES

Although there is no internationally recognized SPF list used by the global shrimp farming industry to date, the current working list of specific pathogens for SPF penaeid shrimp in the United States developed by the USMSFP is the most comprehensive in the world. This list is dynamic and will be revised and expanded as new pathogens are identified and more accurate disease diagnostic tools become available.

### WHAT BUYERS NEED TO KNOW

Shrimp farmers who want to purchase SPF shrimp should ask the following questions:

- ? What specific pathogens are on the supplier's SPF list?
- ? What disease diagnostic tools were used to screen the shrimp?
- ? When was the most recent screening performed and by whom?
- ? What disease surveillance program does the supplier follow to monitor his stocks?
- ? What is the disease history of the facility?

The purchaser of SPF shrimp should also receive a copy of the most recent disease screening results and appropriate certification.



### USMSFP List of Pathogens & Diseases for SPF Penaeid Shrimp

Pathogen Type	Pathogen	Pathogen Group	Category <sup>A</sup>
VIRUS	*TSV	dicistrovirus	C-1
	*WSSV	nimavirus (n.f.)	C-1
	*YHV/GAV/LOV	ronivirus (n.f.)	C-1,2
	**IHHNV	parvovirus	C-2
	**BP	occluded baculovirus	C-2
	**MBV	occluded baculovirus	C-2
	**BMN	unclassified nonoccluded BV	C-2
	HPV	parvovirus	C-1, 2
	IMN	totivirus	C-1, 2
PROCARYOTE	NHP	alpha proteobacteria	C-2
PROTOZOA	Microsporidians	microsporidia	C-2
	Haplosporidians	haplosporidia	C-2
	Gregarines	apicomplexa	C-3

<sup>A</sup>C-1 pathogens defined as excludable pathogens that can potentially cause catastrophic losses in one or more American penaeid species; C-2 pathogens cause economically significant disease and are excluded from breeding centers, hatcheries, and some types of farms.

\*Listed by Office of International Epizootics as a "Notifiable Disease" as of May 1999

\*\*Listed by Office of International Epizootics with "Other Significant Diseases" as of May 1999

### GET MORE INFORMATION

More information about SPF terminology, its use and misuse, and establishment of quarantine and biosecurity protocols can be found in:

- **Moss SM et. al.** 2003. SPF Defined: Pathogen-Free Status of Shrimp Limited. Global Aquaculture Advocate, pp. 86-87.
- **Lightner DV.** 2003. Exclusion of Specific Pathogens for Disease Prevention in A Penaeid Shrimp Biosecurity Program. Eds: Lee C-S, O'Bryen PJ. Biosecurity in Aquaculture Production Systems: Exclusion of Pathogens and Other Undesireables. The World Aquaculture Society, Baton Rouge, Louisiana, United States. pp. 81-116.
- **Lotz JM.** 1997. Disease control and pathogen status assurance in an SPF-based shrimp aquaculture industry, with particular reference to the United States. In: Diseases in Asian Aquaculture III. (TW Flegel and IH MacRae eds.), Fish Health Section, Asian Fisheries Society, Manila, the Philippines, pp. 243-254.

The USMSFP also publishes a list of suppliers that receive USMSFP SPF and SPR stocks on its website, [www.usmsfp.org](http://www.usmsfp.org). The USMSFP sells these animals only to US broodstock producers.