

SPF and SPR stock

Estimated economic losses (in US\$) since the emergence of certain viral pathogens in penaeid shrimp aquaculture:

Virus	Year of Emergence	Estimated loss
WSSV- Asia	1992	\$4 – 6 billion
WSSV- America	1999	> \$1 billion
TSV	1991 – 1992	\$1 – 2 billion
YHV	1991	\$0.1 – 0.5 billion
IHHNV	1981	\$0.5 – 1.0 billion

Sanitary and genetic characterization of the shrimp

i. Regarding their sanitary status, the stocks can be classified as:

Specific pathogen free (SPF): meaning that they are free from specific pathogens, but not necessarily free of all pathogens;

Pathogen free (PE): meaning that they are free of all pathogens (however, this is difficult to prove and assure);

All pathogen exposed (APE): meaning that they have been exposed to potential pathogens, (these are, for example, the broodstock collected from ponds); or

High health (HH): this is a commercial term and vague in terms of description of the stocks.

ii. Regarding their genetic characteristics, the stocks can be classified as:

Susceptible: to infection and disease;

Specific pathogen resistant (SPR): meaning resistant to infection by a specific pathogen (this is a qualitative trait – they can either be infected or not); or

Specific pathogen tolerant (SPT): meaning tolerant to a specific disease, (the animal can be infected but may not develop the disease or it may develop the it to a lesser extent).

Specific Pathogen Free (SPF) Animals

- An SPF animal can be defined as one coming from a population that has tested negative for specific pathogens for at least two years
- The SPF animals are special stock of animals that are kept in SPF facilities under a rigorous monitoring system and are subjected to sensitive and accurate diagnostic methods.

- The SPF animals are not innately resistant to the specified pathogens or infections, although they can possibly be developed as specific pathogen resistant (SPR) species.

Specific Pathogen Resistant (SPR) Animals

- It describes a genetic trait of a shrimp that confers some resistance against one specific pathogen.
- SPR shrimp usually result from a specific breeding programme designed to increase resistance to a particular virus.

Advantages of Using Domesticated and SPF/SPR Stocks:

- Ready, year-round availability of disease-free broodstock
- Ability to be selected for desirable traits such as fast growth rate, disease resistance and, hence, high survival, good FCR and increased production and productivity
- Reduced use of chemotherapeutants
- Better adaptability of domesticated shrimp to captive environments, leading to reduced stress and better mating and reproductive success

The use of SPF populations was immediately reflected in better productivity at every step of production:

Maturation:

- Mortality in reception room dropped from 24 to 0.5 %.
- Mortality after ablation dropped from 15 to 0.3 %.
- Female mortality during production dropped from 5 to 0.1 %.

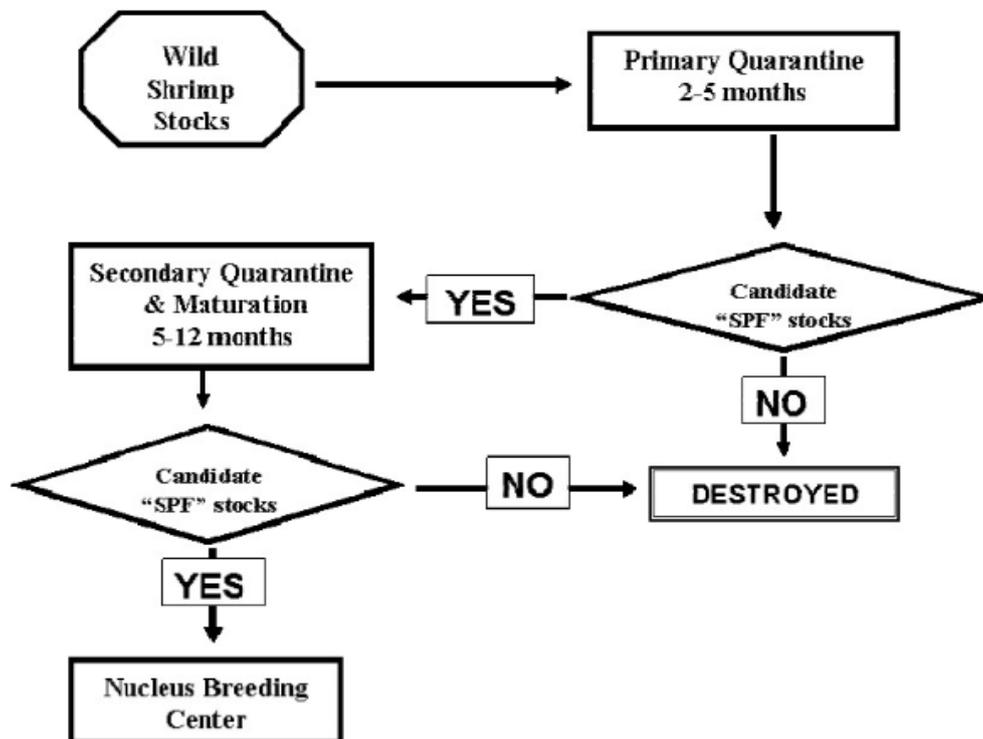
Larviculture:

- Days to PL12 were reduced from 20–21 to 17–18.
- Survival increased from 45–50 to 70–75 %.
- Coefficient of variation decreased from >15 to 12 %.

Grow out:

- Grow out was 6 weeks shorter to reach 15 g.

Procedures used to develop specific pathogen free (SPF) shrimp collected from the wild:



Suppliers of SPF and SPR shrimp:

Organisation	Species	SPF	SPR
High Health Aquaculture Inc.	M, V, J, S	Yes	to TSV1
The Oceanic Institute	V	Yes	to TSV1
Kona Bay White Shrimp	V	Yes	No
Supershrimp Group	S	Yes	to IHHN
Farallon Aquaculture S.A	V	Yes	to TSV1

Species: M = *P. monodon*, V = *P. vannamei*, S = *P. stylirostris*, J = *P. japonicus*,