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SEAFDEC "Better life through aquaculture"

SELECTING WILD SPAWNERS AND BROODSTOCK FOR YOUR PRAWN HATCHERY

Hatchery operators and technicians should know how to select wild spawners and broodstock to get their money's worth. Wild spawners cost from P350 to P1,000 apiece forming a large part of the expenses in operating a prawn hatchery.

Generally, select prawns that are:

1. Healthy - Shell is shiny and clear with no signs of disease or injury.

2. Not stressed - Stress cannot be easily detected and can lead to low spawning and hatching rates. A stressed prawn falls to its side and cannot return to the upright position. Causes of stress are rough handling and transport conditions such as lack of oxygen or low water temperature.

To select good spawners, check the health and lack of stress of the female prawn as described above. Then hold the prawn against the light and classify according to the following maturation stages:

Stage I or immature - Ovaries are not visible externally.

Stage II or early maturing - Ovaries can be seen as a thin linear band extending from the center of the body to the tail.

Stage III or late maturing - Ovaries can be seen as a thick, solid linear band with a slight "diamond" or "butterfly" enlargement in the front portion.

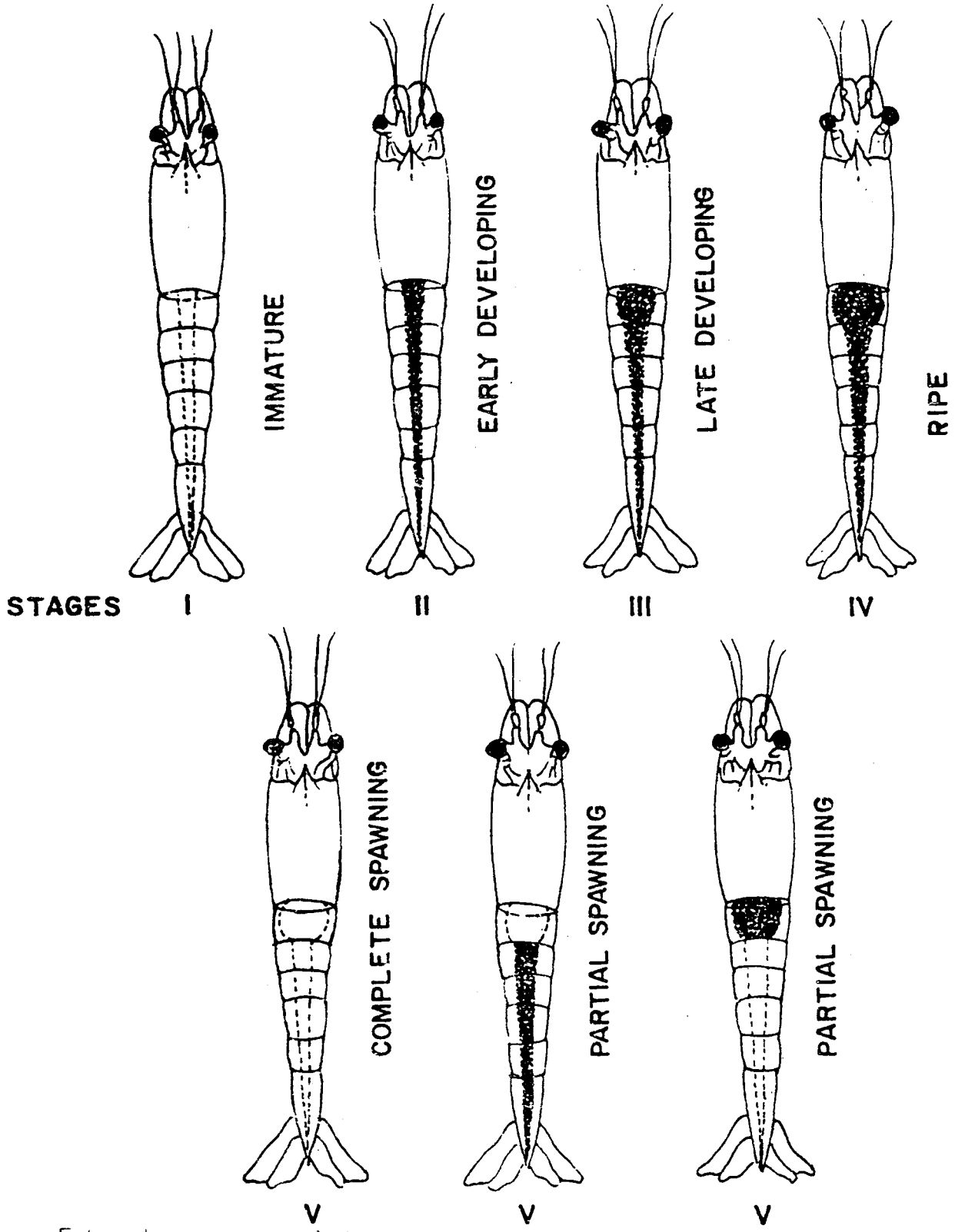
Stage IV or mature - The front enlargement is broader in the form of a diamond or an ear lobe; the linear band is broader.

Stages V or spent - Ovaries appear similar to stage I.

Stages II and IV prawns are ready to spawn and therefore command a higher price. Stages I and II are cheaper and can be used as broodstock.

To select good broodstock, check the health and lack of stress in both female and male prawns described earlier. In addition, check the sizes. Female should be 90 to 150 grams and males 50 to 100 grams in weight for broodstock purposes.

To differentiate female from male prawns, look at the underside of the prawn. Females have a flattened circular organ called the **thelycum** located between the fifth pair of walking legs. Males have protruding organ or **petasma** between the first pair of swimming legs that aids in the transfer of the sperm sacs from the male to the **thelycum** of the female.



External appearance of the ovaries of **Penaeus monodon** at different stages of maturity as seen through the dorsal exoskeleton (after Primavera, 1983).

Source: Lecture Notes of J. Honculada-Primavera, Head of Training Division, SEAFDEC Aquaculture Department, Tigbauan, Iloilo. 1987.

ILOILO FISH PORT SEEN AS PRAWN PROCESSING, EXPORT CENTER IN RP

Port Manager Robert Jordan said the Iloilo Fishing Port Complex (IFPC) is exporting some P30 million worth of prawns per week to Japan, Europe, Australia, and the United States.

What are the factors behind this giant leap?

The growth of the fish port in Iloilo was boosted by the Asian Development Bank-assisted Aquaculture Development Project implemented in the provinces of Iloilo, Capiz, and Aklan and the diversification program implemented in Negros.

Iloilo is in the center of the Western Visayas region which has some 61,000 hectares devoted to fishponds of which more than half is used for prawn breeding.

Jordan reported a gross income of P9.5 million at the end of the second quarter this year and a net profit of P2.3 million. The fish port income comes from trading, production, and rent while minimal income is derived from harbor and market operations.

To date, there are six prawn-processors operating in the fishport, namely: Agro-Marine Manpower Corporation (AMMCOR), Purefoods Corp., Agribase Ventures, Ercer Marine Export, A-1 Export Trading, and Azure Pacific Trading.

Another company, Interpress Enterprises, is involved in processed meat products and canned **aligi ng sugpo** which is now making waves in domestic and international markets. Another company, Koyo Marine, Inc., is expected to be in full operation in processing squid and cuttlefish products for foreign markets. Jordan said three more agri-based companies have signified their intentions to operate inside the port complex.

Aside from marine products, facilities of the Complex can process livestock, vegetables, and poultry for domestic and foreign markets.

The 21.8 hectare fish port was established 12 years ago by the Philippine Government with some P300 million investments partly funded by Japan through its Overseas Economic Cooperation Fund (OECF).

Another project on the drawing board is the establishment of a laboratory for research and development right at the fishport.

Source: The Manila Chronicle, August 16, 1988.

WEATHER CHANGES AFFECT SHRIMP HATCHERIES

Unseasonal weather in 1987 brought mixed fortunes for the shrimp industries of Ecuador, Central America, Indonesia, and the Philippines.

In Ecuador and Central America the infamous El Niño current severely affected the production of the shrimp in hatcheries in 1987. El Niño is an unpredictable surge of warm water which occurs every two to seven years off the coast of Peru and has a major effect on weather conditions.

Extended drought periods and excessive rain can severely affect agricultural production throughout the tropics. In Southeast Asia, the long expected wet season did not arrive on schedule. This wet season has the potential to flood or destroy ponds, wiping out stocks completely. The duration and intensity of these annual rains is also a paramount importance in providing the required pond salinities for stocking and optimum growth.

In the Philippines, the demand for hatchery fry continued at a high level throughout 1987. Early in the year, many hatcheries experienced production problems due to the water and nauplius quality. As a result, only a small number of hatcheries managed to produce commercial quantities of fry and those that did were in the enviable position of having a long waiting-list of buyers.

In the latter part of 1987 fewer typhoons in the Philippines encouraged many farmers to risk stocking their ponds later in the year than usual. As a result demand for hatchery-produced fry continued for a longer period than expected. This demand was further increased by the development and intensification of pond areas in the Visayas, which is usually less susceptible to typhoon-influence.

The shrimp industry in Southeast Asia this year seems bright, despite the many climatic problems that affected project success last year. In Indonesia, the continuing commitment of the private and government sectors should see the industry develop further and in the Philippines, political stability sees even more of the foreign funds being injected into both hatchery and grow-out projects to give an additional boost to prawn farming.

Source: Fish Farming International, Vol. XV, No. 4, April 1988.

CHOLESTEROL RESEARCH ON SHELLFISH

Oysters are finally shucking their negative image in dietary circles.

For years, shellfish were regarded as a forbidden food for people with high blood cholesterol, says Annette Redell Hegen, a Texas A&M University Sea Grant consumer education specialist. But according to **Texas Shores,** a publication of Texas Sea Grant, new research studies have demonstrated that cholesterol values of shellfish are far lower than what previous studies indicated.

Apparently, the older cholesterol tables were based on chemical analysis of foods that detected non-cholesterol components along with cholesterol. In reality, Hegen says, oysters, clams, scallops, and mussels are the lowest of all seafoods in the cholesterol area, ranging from 39 mg to 77 mg per serving, depending on season of catch, state of reproductive cycle, and the food they eat.

Even shrimp is now reported to have between 125 mg to 180 mg for a $3\frac{1}{2}$-ounce serving as opposed to older values that were always reported to be much greater than 180 mg. Unfortunately, Hegen says, many physicians still pose dietary restrictions based on old inaccurate tables.

But while oysters are good for you, they aren't magic. Contrary to legend, oysters aren't really aphrodisiacs. Hegen says the popular myth that oysters possess powers above nutritional benefits is not quite true.

However, oysters are loaded with zinc - an essential nutrient crucial to sexual maturity and fertility. Now the mineral is also known to play several roles in a healthy lifestyle, including protection against infection and possibly cancer. Zinc speeds the healing of wounds and is important to the proper working of the immune system.

"Only a small portion of the zinc we consume is absorbed," Hegen says, "so the Recommended Daily Allowance for adults is set at 15 mg, even though we need only 2 mg a day." Three ounces or around 90 grams of oyster meat provide 75 mg of zinc. An average $3\frac{1}{2}$-ounce serving of raw oysters also provides 74 calories, 50 mg of cholesterol, and 110 mg of sodium.

Source: AQUACULTURE MAGAZINE Vol. XIV, No. 3, May/June 1988.

FISH OIL MAY HELP DIABETICS

Medical researchers in Sydney, Australia have discovered that the use of fish oil may be possible for the treatment of diabetics.

A team led by Dr. Ted Kraegen and Dr. Don Chisholm from the Garvan Institute of Medical Research and Mr. Glenn Ford of the CSIRO Division of Food Research found that an unsaturated fat, known as Omega-3 from fish oil, was linked to insulin resistance.

After successful tests of laboratory rats, clinical trials are now being undertaken with a small group of Sydney diabetics. This has shown that Omega-3 is more beneficial to diabetics than other types of unsaturated fats, according to one of the team, Dr. Leonard Storlien.

Other studies have highlighted the benefits of eating fish, for example, eating as little as 30 grams of fish a day significantly reduces the risk of heart disease.

Source: **Austasia Aquaculture Magazine,** Vol. 2, No. 4, November 1987.

AFN-VI-4-5

FISH SPERM CAN BE SENT WORLDWIDE

Frozen fish sperm from a British company - Cell Systems - can now be sent around the world to improve a fish farmer's stock or to safeguard him against stock losses from a sudden disease.

The company believed to be the only organization in the world offering a commercial service in fish sperm is now working on ways to freeze not only sperm but fish eggs and even semi-matured fish embryos. If successful, this would mean fish farmers could buy frozen eggs and fertilize them at any time of the year.

Cell Systems is currently able to freeze oyster eggs and embryos and soon expects to be able to supply frozen eggs from carp with frozen eggs from salmon or trout expected to be available in a few years.

Artificial insemination revolutionized agriculture, and Cell Systems believes similar opportunities are opening up for the fish farmer. Previously impossible experiments in inter-breeding could be tried, such as the matching of a Tasmanian trout with a Swedish trout, a hybrid so far impossible because of differing global seasons.

Source: **Australian Fisheries**, Vol. 47, No. 3, March 1988.

AFN-VI-4-6

AZOLLA MAY ALSO BE GOOD FOR FISH

A tiny free-floating water fern called azolla is seen as a potentially huge source of cheap fertilizer by low-income rice farmers. Investigations into uses for azolla also indicate that it may have a place in fishfarm feeding, on its own in some cases but probably more as a feed constituent or supplement.

The azolla plant is considered to have high potential as a nitrogen fertilizer under irrigated rice-farming systems because of its adaptability to lowland rice culture.

Most azolla species double their biomass in three to seven days. When allowed to grow year-round they can produce 200 to 300 metric tons of fresh azolla biomass per hectare a year.

Agriculture interest is in the potential nitrogen content of this biomass of 300 to 500 kg per hectare. It also makes an excellent compost with rice straw and being a high protein source, can be used as food for fish.

Azolla has long been used as a source of nitrogen in paddy fields in China and Vietnam, and this is stimulating interest in other developing countries and a number are investigating it.

In 1982 the government launched a National Azolla Action Program to promote nationwide use and in mid 1982 the Asian Development Bank (ADB) extended a US$250,000 technical assistance grant to the Philippines for an Azolla Research and Development Project. More than 50,000 hectares of rice land in the Philippines are now intercropped with azolla.

"Azolla production could be integrated into livestock farming and fish culture to provide additional benefits to farmers," said Dr. P. C. Payawal, the Project Manager.

Source: Fish Farming International. Vol. XV, No. 6. June 1988.

AFN-VI-4-7

POISON DANGER FROM PVC PIPES

The use of polyvinyl chloride (PVC) pipes is widespread throughout the aquaculture industry - but could this practice be the cause of previously unexplained kills of fish, crustaceans or shellfish? Or worse still, are aquaculture products for human consumption being contaminated with this toxic compound?

Lead leaching out of PVC pipes is a possible cause of poisoning. The lead comes from lead stearate added to PVC to make the pipe malleable. Unfortunately, lead stearate leaches from pipes into water initially at a very rapid rate.

The Standard Association of Australia (SAA) has placed rules on the treatment of PVC pipes based on the recommendations of the World Health Organization. The SAA stipulates that the pipes must initially be washed under running water for six hours. The pipes must then be filled with distilled carbonated water and left to set for 48 hours. This process must be carried out three times. The lead content of the water drained from the pipe after the first soak must be less than one part per million (1 ppm) and less than 0.3 ppm after the third soak.

The plastic industry is considering replacing lead in PVC pipes with a less dangerous compound. Precautions and treatment are being taken with pipes used for drinking water and pipes used for industrial purposes.

It is suggested that whenever new PVC pipes are installed these should be flushed out continuously for several days before stocks are introduced into the system to avoid any contamination by lead.

Source: **Austasia Aquaculture Magazine**, Vol. II, No. 7, February 1988.

AFN-VI-4-8

ANTI-FOULING PAINT - A DANGER TO MARINE VESSELS AND STRUCTURES

USA and Great Britain expressed concern over the environmental effects of tin-based anti-fouling paint, tri-n-buty tin (TBT) which prevents fouling on marine vessels and structures.

According to a recent article in the **New Scientist** journal, the paint disrupts marine ecosystems and is particularly harmful to oysters. Salmon reared in sea-pens have been found to be contaminated by the paint while reports on mortalities of juveniles salmon in Alaskan sea-pens have been recorded.

TBT residues in the muscular tissues of the fish were found to reach concentrations of 0.9 micrograms per gram of tissue. Cooking does not destroy or remove the compounds from the fish.

Marine scientists in California say that marine life in boat harbors from California to Alaska is being wiped out by the substance, thus prompting U.S. researchers to recommend immediate restrictions on the use of TBT paint while partial ban is effected in Great Britain.

Source: Austasia Aquaculture, Vol. I, No. 9, April 1987.

AFN-VI-4-9

SEAFDEC AQD 1989 TRAINING COURSES
(Tentative Schedule)

Courses[a/b]	Dates	Training Fee[c/]
Fish Health Management (FISHHEALTH)	16 Feb-14 Mar	₱ 5,700
Culture of Natural Food Organisms (NATURAL FOOD)	11 Apr-09 May	5,200
Brackishwater Pond Culture[d/] (POND CULTURE)	11 May-09 Jun	6,100
Prawn Hatchery and Nursery Operations (PRAWNHATCH)	16 May-04 Jul 01 Aug-19 Sep	8,350 8,350
Hatchery of Marine Finfishes (MARFISHHATCH)	01 Jul-29 Aug	7,700
Fish Nutrition (NUTRITION)	13 Sep-24 Oct	6,900

a/ A course session may be cancelled due to lack of qualified applicants.

b/ For telegram and telex communications, use abbreviated course title (FISHHEALTH, PRAWNHATCH, ETC.).

c/ Basic training fee covers lodging (electricity and amenities billed separately) at SEAFDEC stations, cost of registration, training materials, field trips, honoraria for resource persons, accident insurance, and medical consultation. Other fees include a refundable breakage fee of P500 (for training courses with laboratory practicum). Average cafeteria meals costs P20-35. All fees must be paid in full on or before the start of the training course, otherwise admission will be cancelled. Payment should be made in demand draft, manager's check, cashier's check, or telegraphic transfer payable to SEAFDEC Aquaculture Department, or in cash.

d/ Course emphasis is on the semi-intensive culture system.

INTERNSHIP TRAINING

Upon request, internship training may be arranged for individuals and small groups in the areas of nutrition and feed formulation, chemical/proximate analyses, plankton culture, instrumentation, and other laboratory work. Training in finfish/prawn hatchery, pond grow-out operations, and disease diagnosis is covered exclusively by the regular short-term training courses.

PRACTICUM TRAINING

The Department accepts a number of undergraduate fisheries students for practical work (maximum of 400 hours) as a requirement for graduation. Applicants will be screened on the basis of application form and endorsement of the college dean. Acceptance will also depend on the availability of a research project in any of the Department's stations to accommodate the practicum trainee(s).

For requests for application forms and further information, please contact:

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