

- Periodical growth performance and survival checking should be undertaken;
- Thin-out sea urchins to make sure that all of them grow optimally.
- Reduce the stocking density in the cage by half at least 2–3 months after stocking.

Harvesting and Marketing

- Harvesting is done after 6–8 months or when the stocks reached 7–8 cm TD.
- Sea urchins are sold fresh or in roe form depending on the available market.



Market Opportunities

Sea urchins are sold in various forms as live and as fresh, salted, or fermented roe. Sea urchin roe is considered a premium marine delicacy in different countries like Korea, Greece, France, New Zealand, and Japan.

Sources:

Philippine Council for Aquatic and Marine Research and Development. Cage culture of sea urchin (*Tripneustes gratilla*): A Technology Manual. Los Baños, Laguna: PCAMRD, 2011.

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Cage Culture of Sea Urchins

Sea urchins (*Tripneustes gratilla*), locally known as 'swaki', 'santol-santolan', 'maritangtang', and 'kuden-kuden', are ball-shaped animals or highly armored creatures which protect their soft parts with sharp spines and a hard shell. They are considered as obscure cousin of the starfish which live in shallow marine waters or within the intertidal zone along the corals, seaweeds and seagrass beds. They feed on algae or seaweeds at night or at high tide.

The sea urchin's only edible part is its roe or gonad, which dominates the interior of its body, with as much as 30% of the wet body weight.

Nutritive Value and Other Uses

Sea urchin roe or gonad is rich in Vitamins A, B2, D, E, zinc, and protein, particularly alanine, inosinic acid, glycine, glycogen, carotenoids, methionine, and valine. They also have medicinal properties. The roes contain no carbohydrate.



The shells of sea urchin are used as fertilizer and for manufacture of novelty items like decoys, decorative vases, kitchen utensils, candleholders, table lamps, and fashion jewelries.



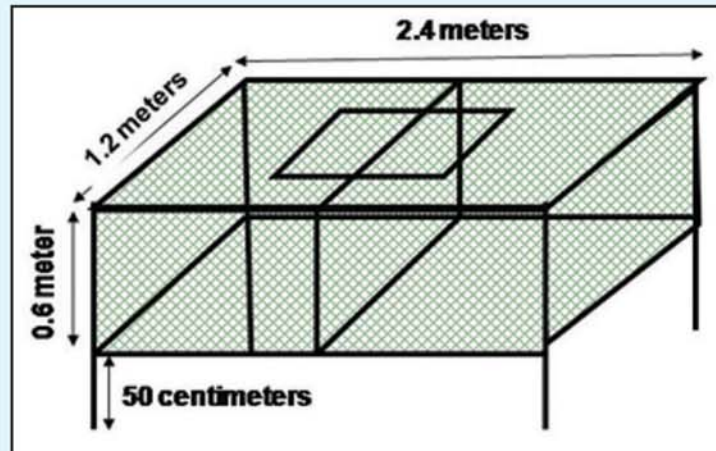
Grow-out Culture in Cages

Site Selection

- the site must have good water movement and tidal flushing
- sheltered from storms and bad weather
- no nearby freshwater sources such as river mouths
- with sufficient water depths of at least 1–1.5 m during low tide
- should be pollution-free
- accessible both to transport and abundant source of Sargassum

Cage Materials and Design

- Materials:
 - Round bars or bamboo (thick species)
 - Polyethylene rope
 - Plastic screen
 - Nylon twine (#100)
 - Welding rods (if round bars are to be used)
 - Welding machine
 - Cutter
 - Bolo
- Cage dimension:



- Cages should be installed at 0.30 m above sea floor and 0.5 m below water level during low tides
- Cages should be set at 0.6 m apart to ensure good water flow and prevent clogging from wastes and debris
- Cages should allow easy monitoring, feeding, sampling, and harvesting of sea urchins.
- Provide enough surface area and shelter
- Durable and long lasting

Stocking

A cage (1.2 m x 2.4 m x 0.6 m) can be stocked with 250–500 sea urchin juveniles of 30–45 mm test diameter (TD). The University of the Philippines Marine Science Institute (UP MSI) station in Bolinao recommends a stocking density of 500 juveniles per square meter that is subsequently thinned-out during growing period.

Source of Stocks

Young sea urchins are found hiding beneath rocks at the base of large boulders or crevices. Some are entangled among seaweeds or seagrasses. Gathering of sea urchins is usually done during low tide. Collected juveniles are placed in bamboo or woven rattan basket lined with Sargassum or seagrasses and is submerged in water. Sea urchins of similar sizes are stocked together to prevent predation of smaller ones.

Feeding and Management

- Culture is for a period of approximately 6-7 months or until stocks reach 7–8 cm TD;
- Stocks are fed liberally with Sargassum or aragan once or twice a week;
- Regularly clean the cages from decaying leftover feeds, clinging weeds, and debris to avoid fouling and stressing the sea urchins which may cause death
- Cages should be stocked with fresh Sargassum and must be regularly cleaned;