

Checklist of species for cage / pen culture

By **R Buendia**

Species	Cage / pen dimension	Culture specifics	Country / Reference
<input type="checkbox"/> MILKFISH <i>Chanos chanos</i>	rectangular marine pen, 20 x 50 x 6 m (1,000 m ² x 6 m); wood, bamboo, polyethylene net <i>See also related article.</i>	stocking density is 30,000 fingerlings weighing 10 g; feeding with commercial pellets or crumbles, given 3x daily to satiation, and with FCR of 1.77; 138 days culture period, 94% survival; production about 5-7 tons	Philippines (Ramos 1996, Bagarinao 1998)
<input type="checkbox"/> SEABASS <i>Lates calcarifer</i>	cylindrical floating netcage, 2 m dia. x 2 m depth (6 m ³); wood, bamboo, polyethylene and 200-li plastic drums for floats box-shaped floating netcage, 5 x 5 x 3 m; wood and plastic drums rectangular broodstock floating netcage 4 x 4 x 3 m, installed with a hapa net of the same dimension with mesh size of 0.4-0.6 mm as egg collector; made of bamboo, wood and 200-li plastic drums circular or rectangular broodstock floating netcages, 4 x 4 x 3 m or 10 x 10 x 2 mm nylon mesh of size 4-8 cm 2 x 2 x 1.5 m or 10 x 5 x 1.5 m floating netcage 3 x 3 x 2 m floating netcage	stock. den. is 40 fish per m ³ of size 18 cm; feeding with trash fish, once daily; 9 months culture period, 95.4% survival; production of 490 g per fish stock. den. is 44 fish per m ³ of size 80-100 g; feeding with trash fish, cooked rice bran and aquatic vegetation, with FCR of 4.5:1; 6-7 months of culture, 90% survival; production of 600 g per fish stock. den. is 60-80 fish per cage, sex ratio is 13-28 female-to-male fish; feeding with trash fish daily at 3-5% of body weight; culture period of 4 years; fish matured and naturally spawned; also demonstrates an efficient, simple and cheap egg collector (116 million eggs in one breeding season) stock. den. is 1 fish per m ³ , sex ratio of 1:1 female to male fish; feeding with trashfish and commercial baitfish (the pilchard <i>Sardinops neopilchardus</i>) and vitamin supplement stock. den. is 100 kg per m ² of size 15 cm; feeding with floating pellets twice daily (warm months) or once daily (winter) to satiation, with FCR of 1.6-1.8:1; 8 months to 2 years culture period; production of 350-600 g to 2-3 kg fish stock. den. is 15-25 fish per m ³ of size 2-3 inches; feeding with trash fish once daily; 6-8 months of culture; production of 500-600 g fish	Thailand (Chaitanawisuti & Piyatiratitivorakul 1994) Singapore (Anon. 1986) Philippines (Toledo et al. 1991) Australia (Rimmer et al. 1998) Australia (Barlow et al. 1996) Malaysia (Singh 1991, Ferdouse 1995)



A grouper farm in Negros (west central Philippines)



Photos by I Tendencia

Species	Cage / pen dimension	Culture specifics	Country / Reference
SEABASS <i>(continued)</i>	2.5 x 2.5 x 1.5 m bamboo and polyethylene netting	stocked with juveniles; feeding with trashfish at 5% of body weight twice daily, with FCR of 3.6:1; 4 months culture period; growth rate of 4 g per day	Philippines (Alcantara et al. 1995)
	5 x 5 x 2 m, GI pipe and bamboo, concrete weight	stock. den. of 12-300 fish per m ³ ; feeding fresh trashfish twice daily, with FCR of 4-10:1; 12 months culture period; production of 1 kg fish, 80-95% survival	Thailand (Tookwinas 1990)
☐ GROUPE <i>Epinephelus</i> sp.	3 x 3 x 2 m, 4 x 4 x 2 m or 5 x 5 x 2 m cages, bamboo or wood, with plastic carboys and 2-5 cm mesh net	stock. den. is 20-30 fish per m ³ measuring 9-10 cm, feeding with commercial feeds; 7-8 or 12-14 months of culture; production of 600-800 g fish or 1.2-1.4 g fish	Malaysia (Leong Tak Seng 1998)
	5 x 5 x 3 m, wood and plastic drums	stock. den. is 44 fish per m ³ of size 80-100 g; feeding with trashfish at 3-5% of body weight twice daily; 6-7 months of culture; production of 600 g fish, 90% survival	Singapore (Anon. 1986)
	2 x 2 x 2.5 m or 3 x 3 x 2.5 m, bamboo, wood, or coco lumber, with empty 200 li plastic drums	stock. den. is 120 fish per m ³ of size 13-15 cm (grow-out), 5-13 cm (transition), or 2-3 cm (nursery); feeding with dry pellets and minced trashfish (grow-out) or <i>Chlorella</i> , <i>Brachionus</i> and <i>Artemia</i> (nursery); FCR of 2.5-2.8:1 for dry pellets and 6.3:1 for trashfish; culture period of 1 month (nursery), 3 months (transition), or 8 months (grow-out); production of 500-800 g per fish	Philippines (Quinito & Toledo 1991)



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Species	Cage / pen dimension	Culture specifics	Country / Reference
GROUPE <i>(continued)</i>	5 x 5 x 2 m or 3 x 3 x 3 m, galvanized iron, wood, bamboo, empty plastic drums, carbouys, concrete weight	stocking density is 10-100 per m ³ of size 7.5-10 cm; feeding with artificial feeds and live or frozen trashfish and crustaceans, feeds given at 10% body weight during the first 2 months, 5% thereafter until harvest; 8 months culture period; production of 580 g fish, 80% survival	Thailand (Tookwinas 1990)
	7 x 8 x 2 m	stock. den. is 12-100 per m ³ of size 12 cm or 20 g; feeds given at 10% of body weight on the first 2 months, then at 5% on the 3rd month; 10-18 months culture period; production of 700-900 g per fish	Thailand (Tookwinas 1990)
<input type="checkbox"/> RED SNAPPER <i>Lutjanus argentimaculatus</i>	3 x 3 x 2 m, bamboo frame, polyethylene net and 200-li plastic drums	stock. den. is 90 fish per m ³ of size 12 cm or 20 g; feeding with chopped carangids (<i>Selaroides</i> spp.), feed given twice daily to satiation; 10 months culture period; production of 890 g, 83% survival	Thailand (Chaitanawisuti & Piyatiratitivorakul 1994)
	1 x 1 x 1 m (for juveniles), 2.5 x 2.5 x 4 m (grow-out)	stock. den. is 6 fish per m ² of size 30 g or 100 fish per m ² of size 10 cm or 20 g; feeding with trashfish once or twice a day; 9-10 months culture period; production of 500-960 g fish, 95% survival	Thailand (Doi & Singhagruiwan 1993)
GOLDEN SNAPPER <i>Lutjanus jobni</i>	5 x 5 x 3 m, wood and plastic drums	stock. den. is 44 fish per m ² of size 80-100 g; feeding with trashfish at 3-5% of body weight once or twice daily; 6-7 months of culture; production of 600 g per fish	Singapore (Anon. 1986)
<input type="checkbox"/> RED SEA BREAM <i>Pagrus major</i>	square, circle cages of sizes 4 x 4 x 3 m, 4 x 4 x 4 m, 5 x 5 x 5 m, 7 x 7 x 7 m, 20 x 20 x 5 m; cages may be synthetic, nylon-coated wire or bamboo with styrofoam as buoy	stock. den. is 100 fish per m ³ (1-year old fish); feeding with trashfish (anchovy and sardines) and moist pellet; 1-7 years culture period; production of 800 g to 1.4 kg per fish	Japan (Fukumoto 1989, Shepherd & Bromage 1988)
<input type="checkbox"/> YELLOWTAIL <i>Seriola quinqueradiata</i>	square, circular net enclosures made of bamboo, wood, 50-mm steel pipes; also big open sea cages of sizes 1,600-2,400 m ² with 1-6 cm mesh net	stock. den. is 115-340 fish per m ³ of size 200-500 g or 5 fish per m ³ for size 1 kg; feeding with trashfish (anchovy, sardines, sand lance) and moist pellet; feed given 1-4x daily at 1-3% of body weight or at 4-8% BW for fish less than 100g; FCR of about 5-9:1; 1-2 years culture period; production of 2.5-6 kg per fish	Japan (Fukumoto 1989, Shepherd & Bromage 1988)
	square broodstock floating netcages 5 x 5 x 5 m	stock. den. is 25 fish per cage of size 0.89 g; feeding with moist pellets once every 2 days at 3% of body weight; 20 months culture period or until fish reach maturity and spawning (about 3.7 kg size)	Japan (Watanabe et al. 1996)
<input type="checkbox"/> RABBITFISH <i>Siganus canaliculatus</i>	1 x 1 x 1.5 m cages housed in 6 x 6 m floating raft	stock. den. is 15 fish per cage of size 48-68 g; feeding with formulated diet, given 2x daily to satiation; 100 days culture period; production of 119 g per fish, 100% survival	Indonesia (Tacon 1990)

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Species ¹	Cage / pen dimension	Culture specifics	Country / Reference
<input type="checkbox"/> CARP	bamboo cages 3 x 4 x 0.5 m	stock. den. is 1 kg per m ³ (8-10 fish per kg); no feeding; 6 months of culture in sewage canal; production of 800 g fish	Indonesia (Costa-Pierce 1988)
	2,000 x 5,000 m ² pens made of casuarina poles and bamboo and with monofilament nylon fabric (30 cm mesh)	stock. den. 4-5 million fish per ha (3-days old hatchery-reared); feeding with a mixture of ground nut, oil cake and rice bran; with periodic dressing of organic (manure) and inorganic fertilizers; 3-4 months of culture	India (Basavaraja 1994)
<input type="checkbox"/> GIANT GOURAMI <i>Osphronemus goramy</i>	1.5 x 2 x 1 m cage made of bamboo and wood	stock. den. is 15 fish per m ² , of size 14 g or 9 cm; feeding with yam and formulated diet, 3x daily at 5% of body weight; 18 weeks of culture; production of 180 g fish, 99% survival	Malaysia (Ang et al. 1988)
<input type="checkbox"/> TIGER SHRIMP <i>Penaeus monodon</i>	rectangular or square pen 6 x 6 x 5-6 m made of bamboo with 1.4 mm to 0.5 cm nylon mesh	stock. den. is 4,000 per pen of size 5.0 cm; feeding with artificial feed, trashfish and squid 4-5 x daily at 10-20% of body weight; 3-4 months of culture; production of 100 kg per pen (30 pcs per kg), 75% survival	Thailand (Tookwinas 1990)
<input type="checkbox"/> MUD CRAB <i>Scylla sp.</i>	pens of size 20 x 50 m placed in brackishwater ponds or 4 x 4 x 2.5 m for lagoons	stock. den. is 2 crabs per m ² 100 crabs per pen of size 150-200 g; feeding with fresh trashfish at 10-15% of body weight; 3-4 weeks culture period (fattening), 90% survival	Indonesia (Cholik and Hanafi 1991)
	pens in reforested mangrove areas of size 200 m ² made of bamboo and polyethylene nets	stock. den. is 400 giant crabs per m ² or 200 'pulang' alimango' per m ² , size at stocking is 150-200 g; feeding with trashfish 3x daily at 5-8% body weight; progressive harvesting every 20 days; production of 153,000 kg giant crabs and 76,000 kg of 'alimango', 85% survival	Philippines (Triño et al. in press)
	rectangular cage 140 x 70 x 24 cm divided into 18 compartments, made of bamboo	stock. den. is 18 crabs per compartment, size 175 g; feeding with trashfish, soft-shelled snails, kitchen leftovers, mussel meat, animal entrails; feed given 2x daily at 5% of body weight; 10-15 days of culture (fattening); average weight gain of 110 g	Philippines (Ladra 1991)
	3 x 3 x 2 m and 2 x 2 x 0.6 m made of wooden frame and nylon mesh (3-5 cm)	stock. den. is 30-60 crabs per cage, crab size of 150 g; feeding with trashfish and fish offal; 2-14 days of culture (fattening); profit margin noted as almost 100%; 90% survival	Malaysia (Liong 1991)
<input type="checkbox"/> SEAWEEDS <i>Gracilaria sp.</i>	1 x 0.5 x 0.7 m cages in a 4 x 6 m bamboo raft	stock. den. is 500 g per m ² ; 12 months of culture; growth rate of 16 g per m ² per day	Philippines (Guanzon & de Castro 1992)

¹Tilapia culture (in cages and pens) was recently discussed in this newsletter (March-April 1998 issue), and was not included.

LIST OF REFERENCES WILL BE PROVIDED UPON REQUEST.