Tjahjo Winanto. The study of growth and development of larvae and spat pearl oyster *Pinctada maxima* (Jameson) in different rearing environment conditions. Under the supervision of Dedi Soedharmo, Ridwan Affandi and Harpasis S. Sanusi.

Major constrain in the pearl oyster breeding that are lowest of growth and development of larvae to spat and also low survival rate. One of the affected factors is unknown the optimum of rearing environment conditions, such as temperature, salinity, dissolved oxygen and light intensity. The objective of this research was to determine feeding activity, levels of food consumption, types and correct density of feed for optimizing of larvae growth and development of spat so that obtained high survival rate.

This research consisted of four levels experiments, which are the study of larvae rearing in laboratory, spat rearing in laboratory, rearing of larvae and spat under optimum environment condition and study of spat rearing in the sea. Factorial completely randomized design was applied to know that effect of types and feed density, physiology response of larvae and spat to the levels of temperature and salinity. Completely randomized design was applied to the study of response of larvae and spat to the levels of light intensity. Randomized block design was applied to the study of spat in natural sea waters.

Result of the research showed that environment factors such as temperature, salinity, oxygen consumption and light intensity were significant affected (P ≤ 0.05) to the survival rate, growth of larvae and spat. Optimum temperature and salinity for larvae and spat were 20 °C and 32, 34 % (P ≥ 0.05). Energetic cost for routine metabolism of larvae was average 5.65; 5.98 Calorie g wet weigh⁻¹ hour⁻¹ (21.62; 24.70 J/g wet weigh⁻¹ hour⁻¹) and for spat was 2.18; 2.28 Calorie g wet weigh⁻¹ hour⁻¹ (9.54; 10.02 J/g wet weigh⁻¹ hour⁻¹). The optimum light intensity for larvae was ≤ 200 lux and for spat was ≤ 500 lux.

Larvae were eat in the fist time after hatching at 22–24 hour age (first critical period) and suitable food is *I. galbana*. Life food type and density were significantly affected (P ≤ 0.05) to the survival rate, development of larvae and growth of spat. Feeding schedule for larvae and spat: stage I larvae was fed *I. galbana* (2600–4200 cells ml⁻¹ hour⁻¹). Stage II: *I. galbana* (3700–7800 cells ml⁻¹ hour⁻¹) or *P. lutheri* (2300–7800 cells ml⁻¹ hour⁻¹). Stage III: *I. galbana* (50 %) + *P. lutheri* (50 %) by fed density was 7700–9300 cells ml⁻¹ hour⁻¹. Spat D25–D28: mixture food of *I. galbana* (50 %) + *T. tetrathele* (50 %), by density 8900–10000 cells ml⁻¹ hour⁻¹. D28–D35: mixture fed of *I. galbana* (25 %) + *P. lutheri* (25 %) + *T. tetrathele* (50 %). Food density at D28–D31: 9100–15800 cells ml⁻¹ hour⁻¹. D31–D33: 14600–18200 cells ml⁻¹ hour⁻¹. D33–D35: 17200–18925 cells ml⁻¹ hour⁻¹.

The best of replaced ages of spat from laboratory to the nursery site between 40–50 day old. Optimum density of spat in the nursery was 500 spat collector⁻¹.