

# Enzootic - All-Female Shrimp Aquaculture

**Background:** Founded in 2012, Enzootic is an animal biotechnology and genetics company, positioned to vertically support breeding and farming of all-female freshwater and marine shrimp. As is the case for most livestock species, farming mono-sex populations of shrimp offers tremendous enhancement in performance and economic value. In the absence of the dominant, territorial and aggressive males, all-female populations are particularly well suited to intensive farming—demonstrating outstandingly uniform growth, higher survival rates and superior feed conversion ratios. With these advantages in mind, Enzootic has developed a pioneering cell transplantation technology for the commercial production of all-female shrimp populations, without the use of hormones, chemicals or genetic modifications. This novel technology taps into the natural sex differentiation mechanism of crustaceans and harnesses their unique sexual plasticity to realize the goal of all-female culture.

**Business Strategy:** Enzootic's ability to produce all-female populations is attained via the production of unique 'Super-females', which are commercially sold to freshwater shrimp hatcheries worldwide for breeding. Enzootic's Super-females are produced under strict bio-secure, pathogen-free conditions in a designated desert facility, isolated from the world's main shrimp producing regions. The aquaculture industry for the main three farmed freshwater and marine shrimp species uses an estimated 17 million breeding females annually, representing a market potential of \$340M. In the application of the all-female technology to its first commercially important freshwater shrimp species, Enzootic chose a strategy of direct sales to hatcheries. For other shrimp species, different go-to-market strategies are explored. Since 2017, Enzootic is commercially supplying freshwater shrimp Super-females to hatcheries in China, Vietnam, Thailand, Malaysia, and Taiwan. With the growing awareness and demand for the superior all-female culture, Enzootic is preparing to expand its broodstock offering, and is working on the first female-specific feed, uniquely designed to enhance performance of all-female shrimp populations.

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