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Genetic improvement strategy in small aquaculture industries: the New Caledonian shrimp experience (Stratégie d’amélioration génétique dans les petites filières aquacoles : l’exemple de la crevette calédonienne.)

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Shrimp farming in New Caledonia relies on the culture of a domesticated strain of Litopenaeus stylirostris introduced from Mexico at a time when genetic principles were of little or no consideration. Since then, advances in agriculture and for some aquatic species of importance led calédonian shrimp farmers to reconsider the appropriateness of a genetic improvement strategy adapted to local biotechnical and economical constraints. This questioning involves many different and interrelated aspects: scientific and technologie (genetics, biosecurity, quarantine, ), economic and organizational (financing, diffusion of genetic improvement) and pedagogic (awareness of farmers). Local institutions, producers associations, research centre and sanitary services associated to carry on the test of a first improvement strategy based on the crossing of different strains of L. stylirostris. This conceptually simple approach aimed at eliminating inbreeding, the first genetic limiting factor of improvement in captive populations. A second domesticated strain was obtained from Hawaii by the calédonian farmers, imported through a quarantine under the control of the zoo-sanitary local authorities, and reproduced and tested as pure or crossbred stocks by Ifremer within the framework of an interdisciplinary research project financed by calédonian institutions. Present results for hybrids (better growth and survival in the absence of virus) demonstrate the validity of this approach. They also bring out the importance to simultaneously integrate in a development scheme, a breeding centre to maintain and reproduce disease free breeders.

This strategy and organization, tested in New Caledonia, could possibly be of benefit to other small scale aquaculture activities in the pacific islands.

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