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Minimization of the synthetic androgen 17Alpha-methyltestosterone hormone for sex reversal of Nile tilapia eggs using electrical technique

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With the realization of widespread use of large quantities of sex reversal hormone of the synthetic androgen 17Alpha-methyltestosterone (MT) affect on the environment and the inefficiency and cost of the conventional techniques, the hormonal sex reversal of economic fish needs to modified to avoid the excess use of MT, lessen the duration of treatment and lower the cost of MT hormone used relative the conventional technique of sex reversal by the feed-fry hormone treatment. This work employs our expertise in electroporation of cells to enhance sex reversal in Nile Tilapia eggs to minimize 2,000 times consumption of the treatment and androgen hormone dose (less than 3,600 times) compared to the conventional feed-fry treated and immersion techniques. This novel technique using the transient high-intensity electric fields has potential since it is non-invasive, with no-stress acting on the membrane. The technique could be used to load cells with a variety of different molecules, either through simple diffusion in the case of small molecules, or through electrophoretically driven processes allowing passage through the destabilized membrane. The technique and equipment was designed for large-scale inductions of eggs suspensions (commercial farm in Thailand had requested order more than 1 million-induction eggs/week) rather than for individual eggs aimed at commercialization.

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