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POSTER 15

Aromatase Pathway Mediates Chicken Sex Change in Each Direction

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In the present study, the fertile sex-reversed males were induced from the genetic dwarf females by the treatment of aromatase inhibitor at day 3.5 of incubation.

Five hundred chicken eggs were randomly sorted in two groups of 250 eggs each. Eggs in one group received an injection of 0.1 ml PBS; eggs in another group received 1 mg Fadrozole (4-(5,6,7,8-tetrahydroimidazo(1,5- α)-pyridin-5-yl)benzotrile) monohydrochloride (CGS 16949A, Novartis Pharma AG, Basle, Switzerland). The solution was injected into albumen under the air cell of eggs and the holes were sealed with melted paraffin.

One hundred and twenty-six females and 103 males were obtained from PBS-injected eggs, 104 females and 77 males from those injected with Fadrozole. Among sex-reversed males in the Fadrozole group, two individuals with ID 11636 and 11668 were found to be fertile. They produced sperm and reproduced normal progeny after mating with normal hens by artificial insemination. The fertility for ID 11636 and 11668, respectively, was 22.4 and 5.6% at 30 weeks old. The results of semen quality tests showed that the concentration of sperm for sex reversals, 1.22×10^9 /ml, was nearly half of that for the control males, 2.62×10^9 /ml. The percentage of abnormal sperm of fertile, sex-reversed males was 74%. Furthermore, it was also demonstrated that W sperm possessed natural fertility and resulted in hatched chicks.

The results suggested that avian sex determination and differentiation are more labile than in mammals and might be manipulated by the hormone milieu and especially by oestrogen. Furthermore, the aromatase pathway might mediate sex changes in both directions in the chicken.

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