

Problem of early sexual maturation in farmed cod; triploidy induction as a possible solution



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Introduction

- Occurrence of sexual maturation prior to harvesting is a challenging area for farmed cod industry. Induction of triploidy is one of the main strategies for avoiding maturation in farmed fish.
- The aim of the present study was to examine the growth performance of triploids and diploids under communal rearing condition, until 22 months of age.

Material and Methods

- On April 2009, eggs and sperm of 4 years old broodstock were stripped. A pooled gametes from 2 males and 2 females were artificially fertilized. For triploidy induction, a hydrostatic pressure of 58,600 kPa for duration of 5 min at 25 min after fertilization was applied. As a control, one diploid group was also produced. Equal number of diploids and triploids (115) were PIT tagged and communally reared from 8 to 22 months of age.

Results

- Flow-cytometry analysis showed that the pressure treatment was 100% successful to induce triploidy in cod. At the end of the growth experiment, diploids were significantly heavier than triploids (Fig. 1). Differences in SGR between the ploidy groups was however not significant. Prevalence of deformities was significantly higher among triploids (62.6%) than diploids (33.9%) (Fig. 2).
- In females, 91.9% of diploids but only 5.3% of triploids were sexually mature. In males, 72.7% of diploids and 32.5% of the triploids were maturing. The state of sterility among female triploids was confirmed by the reduced size and dysfunctional gonads. The gonadal developments in male triploids were rather less suppressed (Fig. 3).

Conclusion

- Triploid cod is still far from being established as an alternative for commercial production.

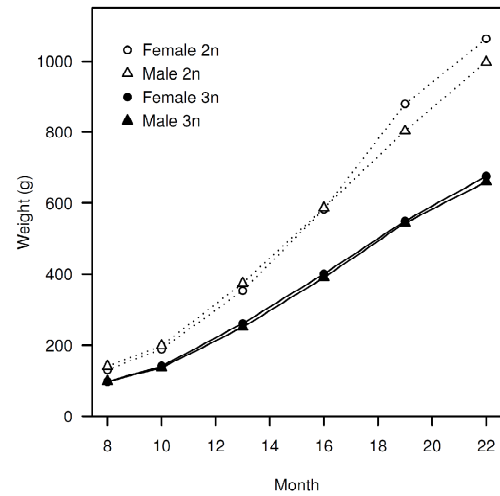


Figure 1. The mean body weight of male and female diploids versus male and female triploids.

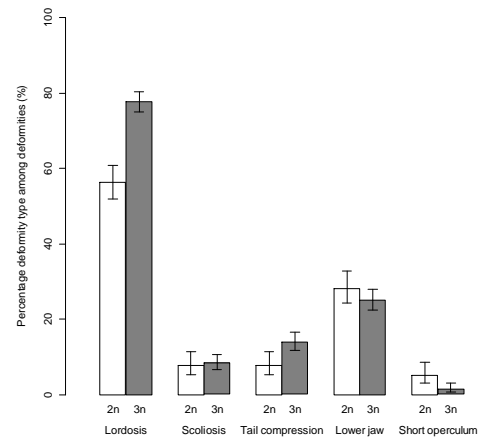


Fig. 2. Prevalence of various type of deformities among diploid and triploid cod at 22 months of age.



Fig. 3. Sexually developing ovary and testis in normal diploid (above) versus the reduced ovary and testis in triploids (below), at the age of 22 months.