

Abstract

The objective of this theses was to detect biological and physical parameters which influence the egg hatching success in the Atlantic Salmon (*Salmo salar*). Nine physical different female and male parental salmons were used for 27 crossbreeds (three one-year old, three two-years old and three three-years old). All parental fish experienced no special treatment and had the same environmental conditions before the experiment started. The eggs of every crossbreed were treated the same way in terms of water parameters, light incidence, measurements and the fertilization process. The degree days until hatching (C°), total egg production (g), total sperm volume (ml), spermatocrit (%), mean individual egg- and alevin weight (mg) and size/ yolk sac length (mm) at different developmental stages, sinking rate (cm/sec) and mortality rate (%) was recorded for/ within 90 days.

The total egg production of longer salmons is higher than the one of small salmons, regarding fully grown salmons. Furthermore, the eggs from older salmons needed more degree days until hatching than younger salmons, while the cumulative egg mortality rate after 90 days was lower for faster hatching eggs.

Longer and older salmons produced bigger egg, regarding fully grown salmons.^[L SEP] The alevin yolk sacs are generally bigger than the eggs were right after spawning. The eggs reached their maximum weight and size right after fertilization and swelling in water for one hour. After that, the weight and size decreased until the alevin hatched. The decrease speed was different for eggs from different female parental salmons. A slower increase in egg weight (%) resulted in a lower cumulative mortality rate after 90 days.^[L SEP] The total production of eggs, the spermatocrit and the egg size and its increase (%) did not influence the cumulative mortality rate after 90 days. The carotenoid content and other genetic influences by the parental salmons play a key role for the mortality rate and so for the hatching success.

In general, the maternal influence on the next generation is highly stronger than the paternal influence. Already by observation with the eye, some tendencies for the hatching success can be identified.