

## New sustainable caviar production – without the necessity to kill sturgeon

**Good news for gourmets, ecologists and aqua culturists:**

**AWI developed a new method for the sustainable and efficient production of caviar from stripped ovulated sturgeon eggs.**

### Context - State of the art

**Ecological problem:** Most of the sturgeon species are seriously endangered and several will die out soon, respectively. Accordingly, caviar production massively decreased from 1977 (30 000 t sturgeon caught, 2000 t caviar legally traded) to 2001 (2950 t sturgeons caught, 85 t caviar legally traded)! As this trend persists, particularly some of the Caspian sturgeon populations (most important provenience of wild caviar) are predicted to be extinguished within a few years.

**Economic problem:** Although growing fast in aquaculture, sturgeons need 5 to 8 years to mature until caviar can be harvested for the first time. In view of fish meal prizes which have doubled within the past 20 years and high operation costs of the culture plant, it is not efficient if the animals can be harvested for caviar only once in their lives.

### Technical problems of non-mortal caviar production:

Until now, the caviar production from ripe ovulated eggs without killing the fish implicated a number of major problems. Contact to water during the washing process converts the outer layer of the ripe egg into a jelly mass, sticking together. Subsequent adding of salt let the soft eggs explode and the result is a slimy mass. Only unripe eggs harvested by opening the fish's body cavity were stable enough to sustain the procedure of making caviar. Caesarean sections to harvest immature caviar generally result in reduced fertility or often in death.



### The AWI Solution



Conventional method of caviar production: harvest of immature eggs by cutting-off (killing) female sturgeon (left). Stripping off naturally ovulated eggs for Caviar production (right) to be treated by the AWI procedure subsequently. Fotos with courtesy DESIETRA, Fulda.

By observing natural processes during egg fertilization, a **new technique for caviar production from ovulated stripped sturgeon eggs** was developed. The **advantages** of the new technology are obvious: No denaturation and quality loss of a high value luxury delicacy as eggs remain in their native state. According to the positive response of star cooks and caviar traders, the result is a highly tasty caviar meeting the expectations of a spoiled gourmet. **Harvesting of eggs is harmless for the fish and, thus can be repeated over many production cycles** and is only limited by the maximum handling size of the animals.

In nature, eggs of all animals are in a dormant state until an external messenger, the sperm, wakes it up. Sperm-egg fusion triggers signalling molecules at nanoscale concentrations within milliseconds and activate a machinery of enzymes. The later make the external egg skin impervious with the aim to avoid multiple fertilization. Within three years of research at AWI the right signalling molecules for the treatment of naturally born sturgeon eggs as well as the appropriate terms of application were found and analytically investigated.

**Additional costs and the extra time needed for the caviar processing with less than 15 minutes are almost negligible.**

Furthermore, one of the promising perspectives of the new technology is that texture of the caviar grains can be modulated according to customer's wishes.

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