

It Can't Always Be Caviar

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Under this title the fabulously daring adventures and exquisite cooking recipes of the involuntary secret agent Thomas Lieven was written by Johannes Mario Simmel, who is now living in Switzerland if I am right. If I did not survey, caviar is only mentioned in two recipes within the story. Here it will be mentioned much frequently.

This story deals with genuine caviar and with imitates of it and shows how thermal analysis (DSC) can be used to distinguish both items. Caviar is, without any doubt, the most widely marketed sturgeon product. Once the egg sack is removed from the female, the eggs are collected by passing them over a mesh screen. Depending on the species of sturgeon, the eggs are graded according to colour, size and taste. The eggs are then salted. The designation "Malossol" on the label, which means "little salt", has become synonymous with a high quality product.

In recent years, world sturgeon populations have declined by 70%. This decline is due primarily to pollution, the use of non-selective fish gear, overfishing, and habitat loss and degradation caused by dam construction on rivers. According to the experts, the number of sturgeon caught illegally is equal to or exceeds the number caught legally.

All species of sturgeon (Order: Acipenseriforms) have been listed in the Appendices of CITES since April 1998. Most species are listed in Appendix II and trade in them is legal if they are accompanied by the appropriate CITES export or re-export permit.

At the end of October 2005, the U.S. Fish and Wildlife Service banned Black Sea beluga caviar imports, one month after the same ban was enforced for beluga caviar from the Caspian states.

Though the depletion of stocks increasing numbers of caviar imitates were found in the markets. These imitates when not properly labelled cause fraud to the consumer which have to pay exorbitant prices for almost "nothing". On the basis of caviar products confiscated by customs it was proved that differential scanning calorimetry could be used as fast and easily performable method to distinguish imitates from genuine caviar. It was not the aim of the study performed to identify the fish species originating caviar products. For that purpose DNA analysis is well suited.

The applicability of thermal analysis appears to be likely because transition peak maximum temperature of the proteins of roe (lipovitellin and phosvitin) is quite different from those of muscle proteins or other possibly components of granular caviar imitates. A survey of relevant patent literature was undertaken to gain sufficient knowledge of processing and composition of caviar imitates.

Instrumental colour measurements taken on genuine caviar and imitates of it reveal the similarity of both and the difficulties for buyers to differentiate by naked eyes between real and artificial. For that purpose a DSC scan is helpful.