

**Stähler**



**Intensive fish farming plants  
system STÄHLERMATIC®**

**EXPERIENCE**

**PROGRESS**

**QUALITY**

**Aquakultur**

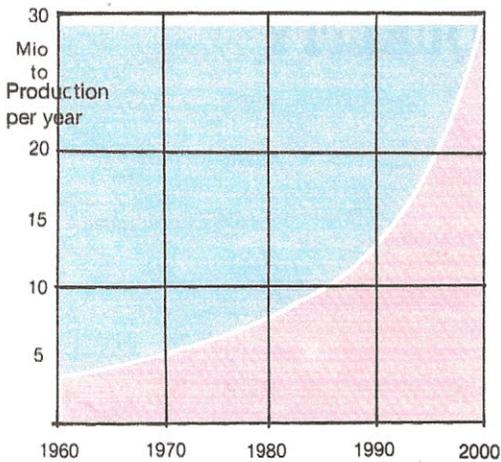
## INTRODUCTION

The aquaculture is a branche expansion worldwide. The dermand for flshes exceed the supply.

Therefore investments in aquaculture are very profitable. The development has two priorities:

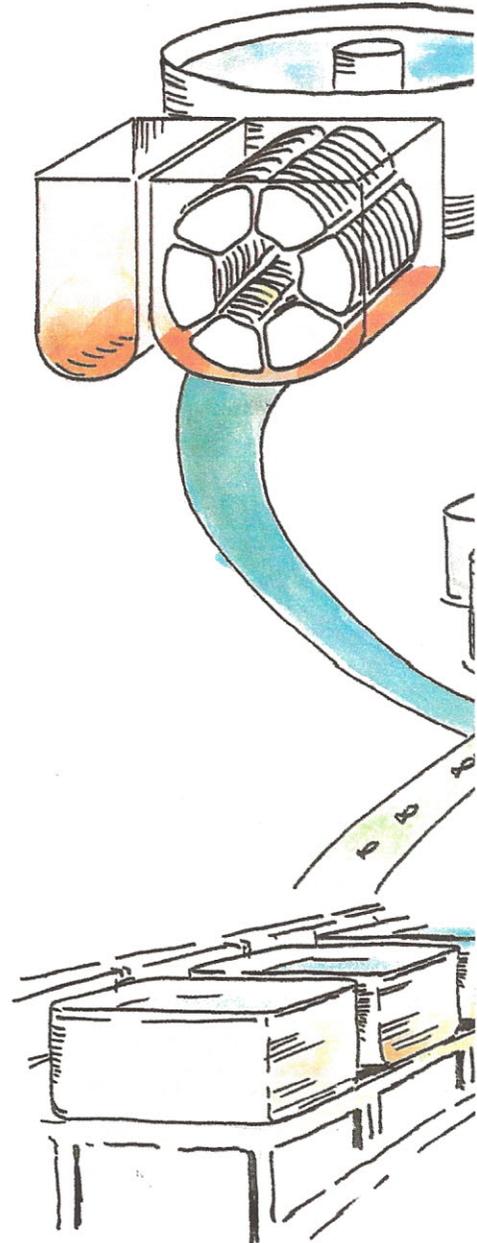
- production of delicatessen with a high marketing value.
- production of food protein for the population of countries with insufficient nutrition.

The vital element of the aquaculture is the water. For example the european industrial countries have a very strained water supply with 1000 cbm each head and year. The decreased rressources of fresh water results in rising difficulties for the commercial aquacultures. Besides this they are natural prejudiced by rising pollution of the water, spreading of fish illnesses and by unfavourable climatic effects.



Development of aquaculture

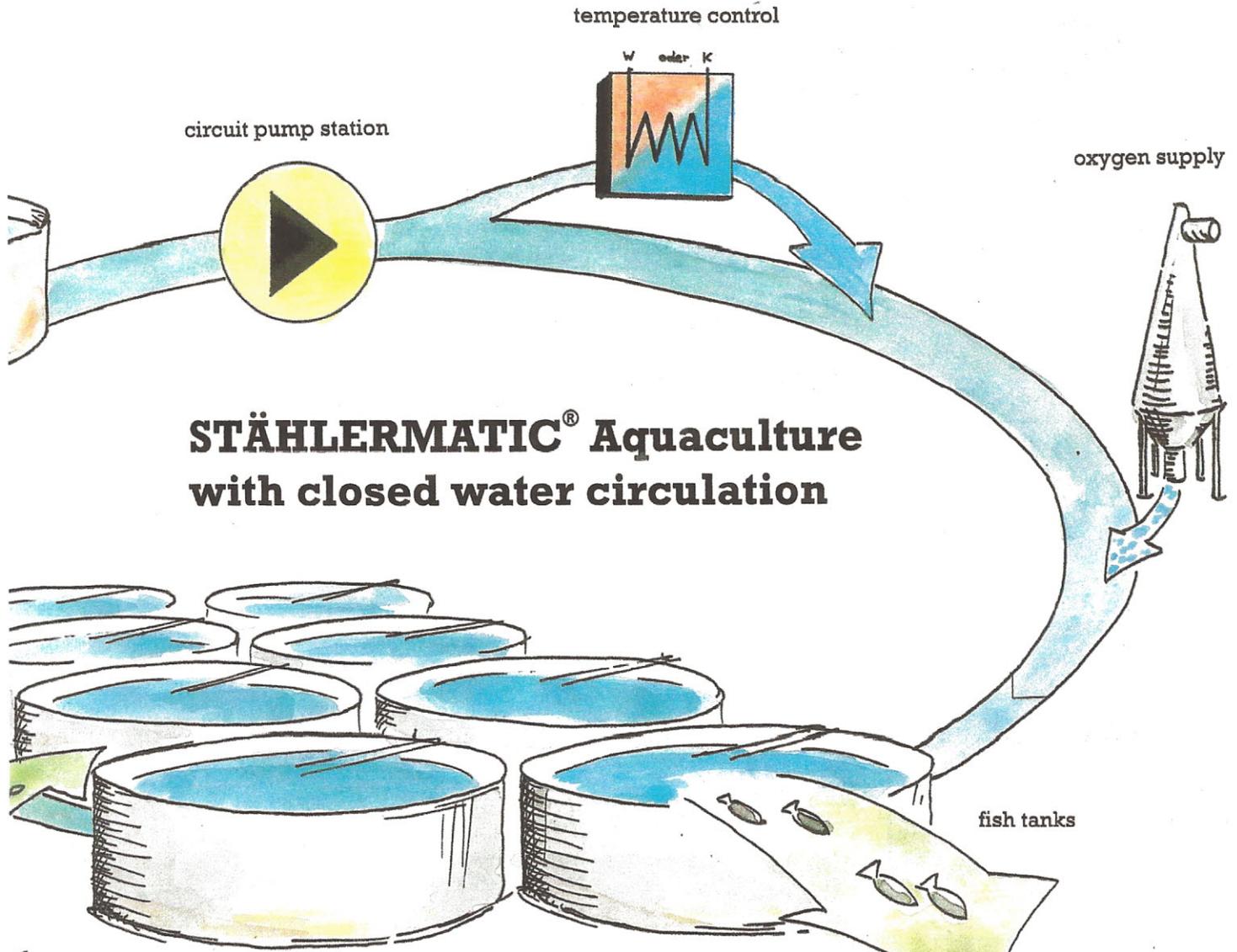
## STÄHLERMATIC biostage for treatment of production waste



breeding plant

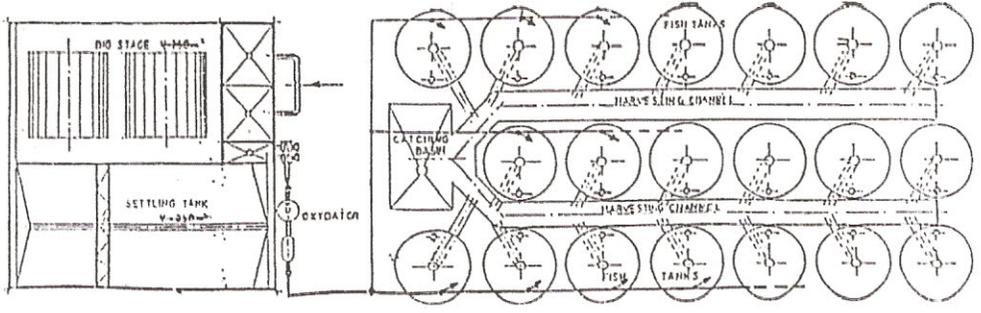


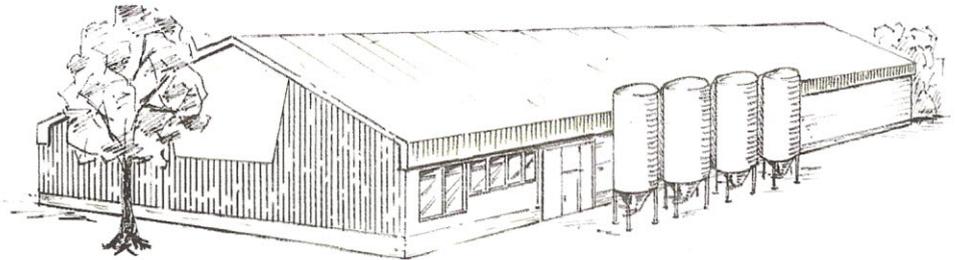
Tilapia: Highest properties of quality and production



# STÄHLERMATIC® Aquaculture with closed water circulation

example for a Stählermatic Aquaculture with closed water circulation arrangement of a plant for a capacity of 100 tons per year





Stählermatic® intensive fish farming plant with a yearly production of 100 t eels

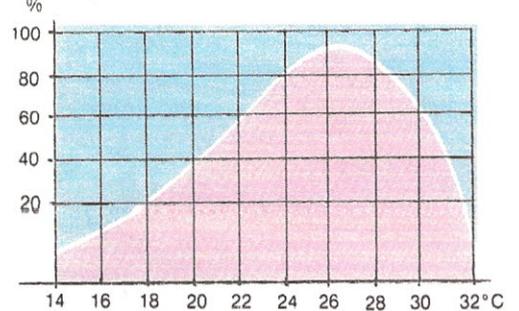
## AQUACULTURE in the latest style

For this reasons the development of processes, which work high intensive, with a low water consumption and which are independent of environmental effects was pushed since many years.

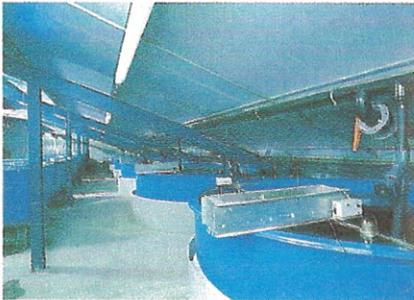
The breeding of fishes in circuit plants is the most intensive and promising kind of aquaculture. Its main task is the purification of wastewater caused by fish excrements.

The object is the ecological, controllable production of high-grade kinds of fishes and crustaceans and also of fingerlings in plants with high technical level.

Growing of an eel in dependence of water temperature



Such a production of fishes allows a strong spatial concentration, low labour costs and high profit. Especially aquacultures with closed water circulation are very successful in this way.



rearing plant for eel fingerlings



biostage STÄHLERMATIC®



production tank of eel fattening plant



automatical feeding of eels with pellets

|                      |        |       |
|----------------------|--------|-------|
| Temp.                | °C     | 24-28 |
| NH <sub>4</sub> -N   | mg/l ≤ | 0,2   |
| NO <sub>2</sub> -N   | mg/l ≤ | 0,1   |
| settleable solids    | mg/l   | 0     |
| fresh water demand   | %/d    | 3     |
| growing rate of eels | %/d    | 0,9   |
| FQ                   | i.M.   | 1,3   |

## The advantages of the intensive fish farming

The fishes can be produced with lowest quantities of fresh water.

The independence of natural plant position give the possibility, to produce near by marketing sites.

This method is independent of climatic conditions and a low energy consumption will be needed to heat the water.

In the plant the fishes are covered against parasites and illness.

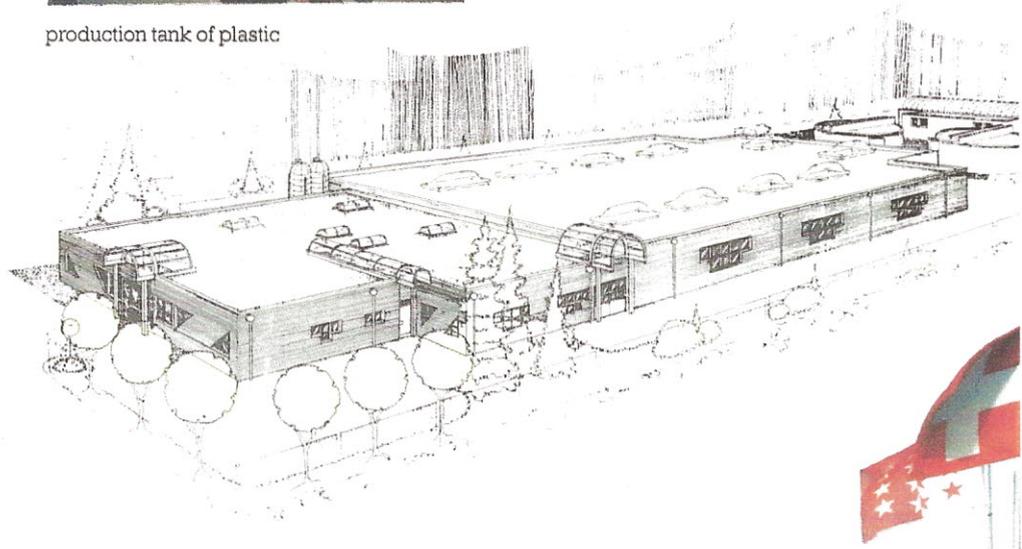
It is possible, to produce the fishes as the marketing demands.

Economical production of fry, fingerlings and food fishes in circuit plants.



production tank of plastic

|                      |      |         |
|----------------------|------|---------|
| Temp.                | °C   | 24 - 28 |
| NH <sub>4</sub> -N   | mg/l | 0,2     |
| NO <sub>2</sub> -N   | mg/l | 0,1     |
| suspended solids     | mg/l | 0       |
| fresh water demand   | %/d  | 3       |
| growing rate Tilapia | %/d  | 2,0     |
| FQ                   |      | 0,9     |



Stählermatic® aquaculture with closed ciculation for a quantity of 150 tons Tilapia per year

Optimal living conditions for the fish by continuously high water quality guarantee better growing rates compared to conventional systems

Biological purification of the wastewater using the combined submerged contact aerator and activated sludge process with the system STÄHLERMATIC®



rearing area



The system STÄHLERMATIC® works only biological without any addition of chemical and without mechanical filters. The eutrophic biomass can be used for feed production or turned to account in the agriculture and conventional fish farms.

### Optimal oxygen supply

Caused of the safe and economical gasification of the circuit water with automatically regulated oxygen reactors an optimal oxygen supply is guaranteed.

### Minimum space requirement

space requirement for a plant of a yearly quantity of 100 tons: appr. 750 m<sup>2</sup>. The technique is kept controllable in accordance with the scientific and practical findings. Variable kinds of the production parts are used made of concrete, plastic or steel.

Stählermatic® fish farming plant in Tallinn/Estonia for production of sturgeon fingerlings and breeding

|                            |      |       |
|----------------------------|------|-------|
| Temp.                      | °C   | 24-26 |
| NH <sub>4</sub> -N         | mg/l | ≤0,2  |
| NO <sub>2</sub> -N         | mg/l | ≤0,1  |
| suspended solids           | mg/l | 0     |
| fresh water demand         | %d   | 3     |
| weight of fish             |      |       |
| Beluga-sturgeons (6 m)     | kg   | 1-2   |
| Beluga-sturgeons (30 m)    | kg   | 5-12  |
| Beluga-sturgeons (6 a)     | kg   | 30-50 |
| Sibirische-sturgeons (6 m) | kg   | 1-1,5 |
| FQ                         | ø    | 1,3   |

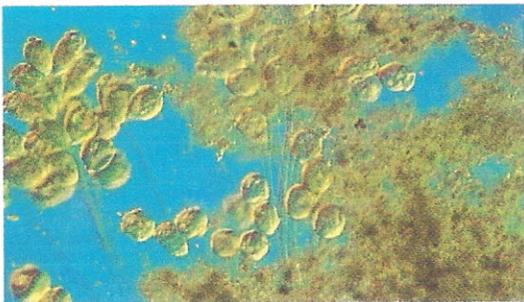
### Experiences of 20 years

#### Highest permanent process stability.

There are more than 40 aquaculture plants with a yearly production capacity up to 400 tons of different kinds of fishes working worldwide. More than 400 wastewater treatment plants for communal, industrial and agricultural wastewater working with the system STÄHLERMATIC®.

#### Highest process stability and water quality using biological wastewater treatment

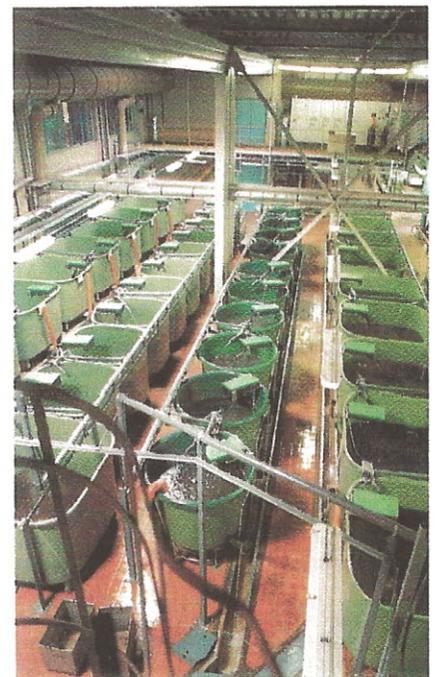
The use of the patented system STÄHLERMATIC® for biological treatment of fish production wastewater guarantees highest process stability. The extensive wastewater treatment with simultaneous nitrification and denitrification and biological P-elimination guarantees continuously, the biological decomposition of products of metabolism, noxious for fishes, ammonium, nitrite and nitrate and organic components.



Microscopic picture of nitrificatic biomass



Building view of a fish farming plant



## Controllable keeping conditions and prophylaxis of illness of the fish stock

The separate arrangement of the production tanks allows a prophylaxis and control of fish illness. The biostage will be used with a content of dry solid matters of  $< 5,0 \text{ mg/m}^3$ . So the pathogenous germs will be eliminated biologically.

## Low water consumption

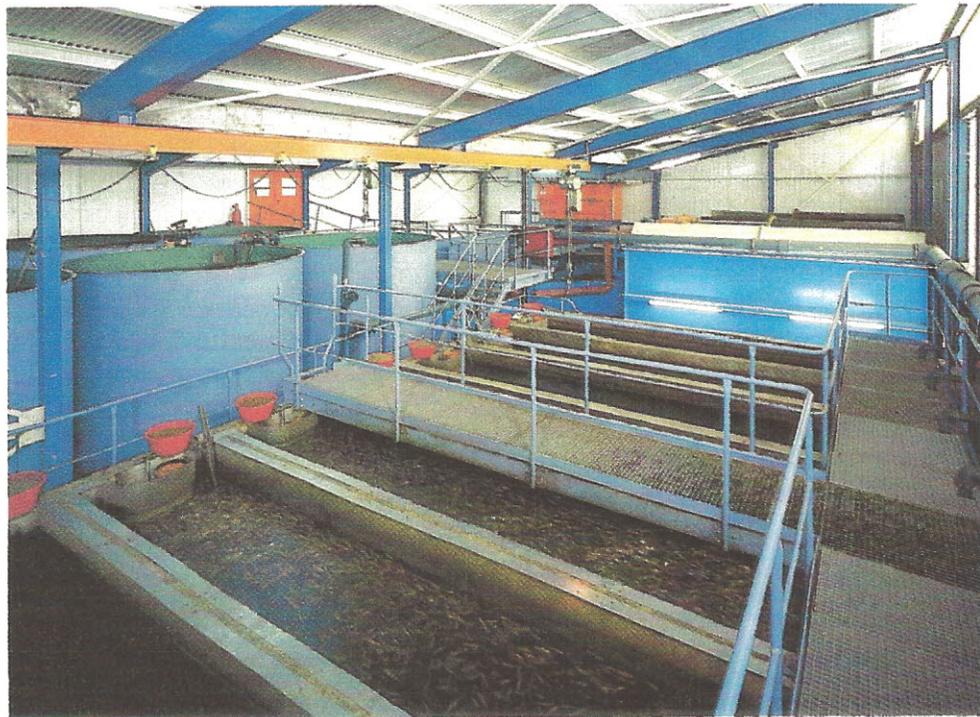
STÄHLERMATIC® aquaculture circulation plants work with fresh and salt water for the production of nearly all kinds of fishes like tropical fishes and cold water fishes. The system needs a water exchange of approx. 3 per cent from the plant volume per day.

## Self control

Easy handling and sure operation by easy measurement for the constant control of the important parameter.

## High feeding exploitation

Optimal living conditions by continuously high water quality guarantee best growing rates.



STÄHLERMATIC® aquaculture for a yearly capacity of 130 tons

|                     |          |
|---------------------|----------|
| a) Fattening plant  | 100 Jato |
| b) Fingerling plant | 30 Jato  |
| c) Breeding plant   | 30 Mio.  |
| d) First forage     | 10 Mio.  |

|                    |      |        |
|--------------------|------|--------|
| Temp.              | °C   | 24 -26 |
| pH-value           |      | 7,0    |
| BOD                | mg/l | 3      |
| COD                | mg/l | 10     |
| NH <sub>4</sub> -N | mg/l | 0,2    |
| NO <sub>2</sub> -N | mg/l | 0,05   |
| settleable solids  | mg/l | 0      |
| fresh water demand | %/d  | 2      |

|               |                 |                  |
|---------------|-----------------|------------------|
|               | Growth rate %/d | Feed quotient FO |
| eel           | 0,9             | 0,9              |
| sturgeon      | 1,8             | 1,3              |
| danubian fish | 2,0             | 1,0              |

## Suitable kinds of fishes for the aquaculture

The plants are qualified for the production of most of fresh and salt water fishes.

## There are secured experiences for following kinds of fishes:

| fresh water   | salt water   |
|---------------|--------------|
| sturgeon      | sea perch    |
| eel           | sea brass    |
| danubian fish | crustaceans  |
| tilapia       | shrimps i.e. |
| carp          |              |
| trout         |              |
| shrimps       |              |
| tench i.e.    |              |



Building of the own plant of Stähler

The own plant of Stähler in Hadamar Niederzeuzheim has a yearly capacity of 120 tons in two lines. The intention of this plant is production of fishes, demonstration, training and research with new kind of fishes. It is possible to visit the plant.

## Services of Stähler GmbH

Marketing of aquacultures plants with closed water circulation and their plant components

Supply of know-how

Providing of know-how documentation and operating instructions

Laboratory equipment for biochemical, bacteriological and analytical analysis for water and fishes

Measurement and control system for aquacultures for the water parameters

### **Issuance of licences for manufacture and marketing of STÄHLERMATIC® aquacultures**

Advice of plant technology, fishery biology and feed technology

Advice of plant technology, fishery biology and feed technology

Providing studies like feasibility studies, operating and marketing studies operating pilot plants and tentative operations

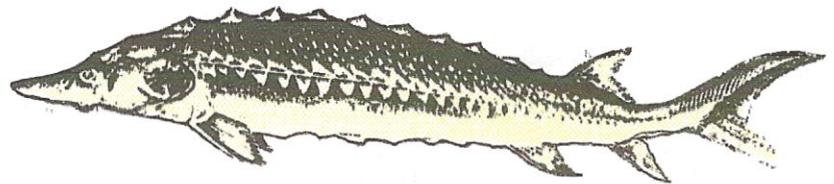
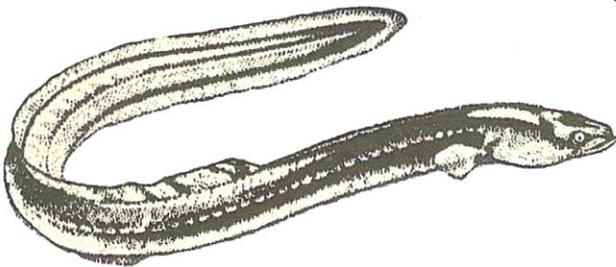
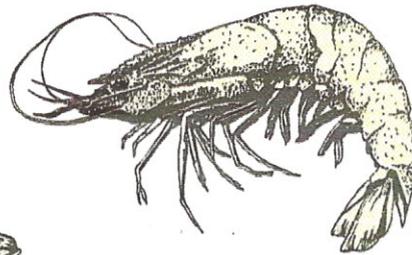
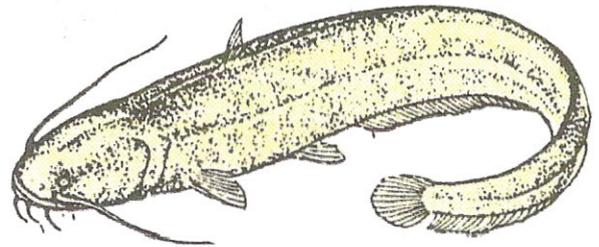
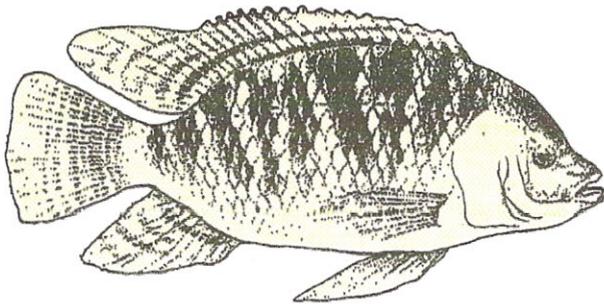
Planning of STÄHLERMATIC® aquacultures, conception for reconstruction of aquacultures

Sending specialists for management, education of staff

Delivery of eggs, fry, fingerlings of different kind of fishes

Arrangement for sale of the produced fishes

Marketing of wastewater treatment plants system STÄHLERMATIC® for communal, industrial and agricultural plants



**STÄHLER GmbH**

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