# 2020

## sustainable opportunity

# STURGEON CONSERVATION FARM



Number of registration of Copyright under European legislation is:
3420-qHhBiwFDeE

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11/11/2020

# Version for rushed readers

**"INNOVATIVE REPRODUCTION STURGEON FARM & SUSTAINABLE HARVESTERS"**

Aims to build a modern sturgeon breeding station

in conjunction with the aquaponic system.

The chosen location is on a land in Romania, 40 km from Bucharest, land that has a deep groundwater source with spontaneous effluent of the highest quality chemically, physically and microbiologically tested.

The details are accessible in the narrative part "Narrative Project 11.11.2020", in Business Plan "Plan Financial Project 13.11.2020" and in the architectural and utility boards of the breeding farm "Plan reproduction station with aquaponics ver 12.1.", which are part of this project.

The farm will deal with the reproduction of sturgeons, the production of fertilized eggs (an extremely rare and expensive product) and the production of sturgeon saplings from famous species existing in the lower Danube basin and in the Azov Sea and Black Sea.

The farm has access to a sturgeon recovery stock consisting of 4,000 females mature of 4 sturgeon species present in the Black Sea and Danube and currently on commercial farms being direct descendants of type F0 (both parents come from the wild) of sturgeons from the natural environment.

All sturgeon females are C.I.T.E.S. records.

The purpose of the supply of juveniles to European aquaculture farms is justified by detailed analyses on the advantages and the possibility of tripling the growth rate and obtaining very

high productions of organic mass of net quality species and with an extremely attractive market price.

An extremely important line of business is the provision with sturgeon seedlings of repopulation programs carried out by the countries bordering the Danube and the Black Sea. Studies show that more than 60,000,000 sturgeon specimens will need to be released to counteract the effects of poaching and improve the vulnerability of these sturgeon species.

The breeding center created aims to offer annually 1,000,000 specimens of brood of the 4 species found in the Black Sea and the Danube.

The project is carried out in an ecological and totally protective way on the environment. Modern molecular filtration technologies and controlled plant nutrient consumption are involved.

The project proposes a pessimistic price option for the products it intends to sell, but which in the coming years will achieve over € 8 million net income and in the weighted version € 21 million net income.

The 30% contribution is tried to be ensured through crediting and credit guarantee mechanisms, from the participation of the interested partners and from the contribution of the founder.

The program includes a lot of scientific data and information, being an elite as the world lines of the approach.

Real models of commercial aquaponics are tested and proven extremely attractive in several large farms around the world, their model being taken over and improved through innovation based on experience in aquaculture in RAS systems, biological filtration and in the salad and herb production industry in greenhouses.

Sturgeon breeding and rearing is provided by a group of leading scientific experts in Europe, whose work is publicly recognized as meritorious and dedicated to sturgeons.

The project also has an inclusive component for a community of socially marginalized people, offering the possibility to carry out seasonal or permanent work activities in the breeding station and in the aquaponic system.

The project has the support of local, national and European authorities, being part of the agenda of economic and scientific cooperation mechanisms in the Black Sea.

**Presentation of business arguments**

- Demand for increasingly expensive aquaculture products!

With higher prices and lower quantities, EU spending on fishery and aquaculture products has increased. With the highest consumer prices ever recorded for fishery and aquaculture products, the figures for 2019 show that in all EU countries more was spent on the purchase of fishery and aquaculture products than in 2018. Spain recorded the largest increase in total expenses. Italy has always been the state with the highest level of total expenditure, while Portugal has the highest per capita expenditure (more than three times the EU average).

- Europe's export import balance in the fish and fish by-products is in deficit of €21 billion.

The volume of imports in 2019 amounted to 6.322.074 tones of fish products, with a net value of € 26,526,547,000. In 2019, consumption of fishery and aquaculture products in the EU was estimated at 24.36 kg per capita. On average, EU citizens consumed 430 grams less fish compared to 2018. Wild catch products dominated by 18 kg (three quarters of the total). Alaska Pollock recorded the largest increase in consumption, with 9%. The most significant decrease of 17% was recorded for the cod, both due to a decrease in imports and a decrease in catches, even though the 2019 level corresponds to its average over the past decade.

- Poor diversification of the European fishery product

Two major freshwater species are present: Crap and Trout
Four major saltwater species are present: Salmon, Turbot, Seabass, Seabream
Only one major freshwater species is present: Scallops
Two major saltwater species are present: Mussels, Oysters
(diversity of subspecies is only with zonal distribution)

- High sensitivity to pathogens of existing species

Fish, like all other living organisms, can be infected by most families of viruses and pathogenic bacteria. Predominantly described as fish pathogens, these include bacteria, spores, fungi, rhabdoviruses, birnaviruses, herpesviruses, iridoviruses, reoviruses, ortomyxoviruses and retroviruses. The most important cause is feeding with industrial food containing waste from the fish, thus allowing the

transmission of pathogens. Another cause is poor genetic purity of the species and a degeneration of immune abilities.

- OLOOSON demand response offer

## Massive introduction of large sturgeons into European aquaculture !

Sturgeon is a large fish that provides a higher growth rate than any other species, for the first three years. After this period, the growth rate decreases and consequently the yield of sturgeon growth on farms. The growth of sturgeons for meat is less developed they are generally bred for caviar, and in the market they end up with only males, after being sexually differentiated. Sturgeon meat is a superior meat to all other freshwater or saltwater species native to Europe. Sturgeon meat can be preserved, smoked, shaved or processed as pastes or fillets.

- False problem: Reproductive material not accessible

A large sturgeon to mature on average must pass 10 years. Farmers who have waited 10 years, or more, will prefer to use their product in caviar form, at prices between 300 €/kg and 500 €/kg (farm gate prices). However, the same eggs are sold in the market with additional artificial processing and fertilization work at prices between €3.000 and €12,000/kg depending on the sturgeon species, which makes the production of fertilized eggs a much more profitable activity than the sale of caviar.

One kg. of eggs of the species Acipenser gueldenstadtii contains 35 - 45,000 eggs, and a mature female produces 3 to 5 kg of eggs, one kg. of eggs of the species Acipenser baeri contains 30 - 40,000 eggs, and a mature female produces 2 - 3 kg of eggs, one kg. of eggs of the species Huso contains 35 - 45,000 eggs, and a mature female produces 10 - 15 kg of eggs, one kg of eggs of the species Acipenser ruthenus contains 50 - 55,000 roe, and a mature female produces 0.3 – 1 kg of eggs.

- False problem: Hard-to-reach and transport-sensitive brood

With zeolite filtration technologies (SturioZeoBox) developed under the OLOOSON brand, the brood can be transported anywhere in the world and in any quantity in 24 hours with a 99% survival rate.

- A large growing market

The market for aquaculture companies with good growing conditions (environment, water quality, temperature) is extremely high. OLOOSON is in possession of databases complete with all legal or physical entities that practice aquaculture in the 27 Europe states + UK. At the moment at the level of december 2020, OLOOSON cannot cope with external demands for sturgeon brood or fertilized eggs, as it lacks the material basis for the processing and production of brood.

- Restocking

The Sturgeons have almost disappeared from the area of the Azov Sea, the Black Sea and the great rivers. In the vast majority of the rivers of central and western Europe, they are completely extinct. Repopulation with sturgeons within Europe Cooperation Mechanisms or in the Black Sea area is eminent, the exploitation of the brood being an important activity. OLOOSON has started the creation of a network of stakeholders from all the countries bordering the Black Sea and the co-opting of the interest of specialists from these countries in the purchase of sturgeon saplings. The act is relieved by the founding's active membership of OLOOSON in the World Sturgeon Conservation Society (WSCS)" and direct contacts with its members in all countries around the world.

- Modern technology, detached from the future

The empty part of the "glass" of aquaculture on traditional farms is the major impact on the environment. The technologies developed and proposed by OLOOSON eliminate the entire nitrogen footprint of the farm and provide an extremely low carbon footprint, which will be offset by renewable energy sources. The farm is made in aquaponic technology and vegetable products are a distinct and important business line, having a large market in the metropolis of Bucharest, the farm being 40 km away.

Arguments

- Genetic purity of sturgeons certified
- High native immunity to sturgeon diseases
- Major growth rate in the growing period (3 months to sale)
- Low costs (organic feed, water volume, low staff)
- Delivery in 24 hours anywhere in the world
- High hygiene and associated with certifications

- Location of the farm and quick access to the largest city in Romania
- Practical experience demonstrated by pilot projects
- Advanced Documentaries (the founder has 5 books written in the field)

1. "The Fish Farmer's Book for Initiation in Sturgeon Breeding in the Recirculating System",
2. "Hygiene, Chemistry and Water Toxicity for a Modern Aquaculture",
3. "Lake, Pond or Fish Puddle"
4. "The Aquaponics or the farm of the future""
5. "Greenhouses and solariums, otherwise..."

- International recognition (finalist in Fish 2.0 competition of innovative aquaculture projects)
- Programs and mechanisms of cooperation (environmental, environmental, economic))
- C.I.T.E.S Regulations
- Global, regional and national legislation and regulations
- Competitive price
- Support (eLearning platform and aquaculture specialization courses, RAS, aquaponics, sturgeon breeding, diseases and treatments.
- Modelling and firm simulation based on the principle of a mass balance
- Expanded Business Plan Modeling
- Modeling Theoretical Narrative Arguments Plan

## Brief pseudo-scientific presentation of the pre-project approaches

Abstract: Growth factor /unit time

This project has its roots in the lack of efficiency of the comparative study of several species of fish from traditional aquaculture, practiced in most extensive or semi-extensive farms in central and eastern Europe. Inefficiency due to too large differences between environmental, feeding and water quality conditions, which differ from farm to farm.

In fact, the initial "click" was generated by the request of their ARIAP members (Association for Innovation in Aquaculture and Fisheries) whose chairman are, to answer the question, what species could grow on farms, in order to obtain a large biological mass production, relative to the unit of time. This theme was launched around the same time as the term for the maturation of certain sturgeon species and not only (as it applies to other species), is far too high to meet the criteria for granting funds from financing euro call, where a term of 5 years is the maximum term of closure of project monitoring, during which the financial results "assumed" must be demonstrated !

So how do you grow sturgeons, which mature in 7 to 14 years, depending on the species?

After we left the "comfortable area" where the fish consider themselves, the entire community of watermen, the first summer and then the second lime and so on... until I reach a commercial dimension, I approached the above topic with the most handy tool of the pseudo researcher... namely, the internet search and reading of dozens and dozens of documents.

In this way, in addition to the wealth of information received, I have gained great respect for a group of researchers, which I will mention below.

A simple approach to the study theme is presented by statistical analysis and by comparing growth patterns of fish species, inferred from age-related size data. That's in the circumstances, where you have access to such data, with reference to several species, linking growth data, with data on temperature, feeding, water quality, circadian cycle, season, etc...

However, this data is not always accessible or credible, or incomplete, or suffers from the distrust and reluctance of farmers to provide data from farms, the quality of the water or food used.

So basically... nothing, concrete, measurable and to the point!

As we all know, statistical analysis is a system that can be used, even for very small size growth models of the sample analyzed, provided that the input data is correct.

The significance of the differences between the growth patterns can be interpreted as an expression of the probability ratio, the validity of which can be confirmed by Monte Carlo simulations. These simulations come from statistical analyses of gambling and in their essence are a broad class of computational algorithms, which are based on repeated and random calculus, sampling, which leads to the achievement of probable results.

As an illustration of the applicability of this approach, we analyzed with remarkable results, a set of data on the, age-related size of a group of sturgeons of the species Acipenser Ruthenus, which we had at our disposal for observation, in a pilot project, on the growth of this species in recirculating systems.

However, with no access to other sturgeon or fish species and the reference systems of the growing environment and the other factors on which growth depends in substance, my study was extremely interesting, but unable to respond to the original theme. The positive differences in size, at the same age of sturgeons in my project, being raised in optimal conditions, compared to sturgeons from various farms have created a strong scientific depression for me. The differences were up to twice the size at the same age.

So, I left the data records and projects to create an inter-farm network for the transmission of growth data and environmental conditions in real time and I returned to the reading room, arranged laboriously in a new office, equipped with a new display with a fantastic resolution.

The readings showed me that other skilled and brilliant researchers studied the field and left behind exciting conclusions, formulas and theories.

So, I learned to use the Von Bertalanffy growth curve with great skill to shape the length of fish relative to age. Since for sturgeons I didn't have a data set related to the calculation formula, I created one based on the data I had at the time.

This type of analysis was initially used to highlight a significant difference in length between males and females between 2 and 6 years of age, on a small batch of sturgeons, already sexually differentiated by ultrasound method, a functional technique of sexual differentiation, impossible otherwise to be achieved in a non-invasive way, due to indistinguishable differences in sexual dimorphism, specific to sturgeons.

The study was not successful, because with age the differences between the sexes decrease dramatically, making career and glory techniques of sexual differentiation by ultrasound.

However, readings are useful at any age, because they can solve an expectation... unexpected, of another theme, related to your growth rate specific to each species.

In order to be able to respond to all the misunderstandings in the topic addressed, because in the case of hybrid interspecies of sturgeon, information on the specific size of the hybrid is transmitted genetically, we started the thorny and steep path of genetic studies.

But, let me not rush by throwing all the cards into play, pain stakingly arranged, based on the above-mentioned algorithms, into one winning hand.

The entire scientific world and the entire industry use non-parametric tests, (obtained by statistical randomization techniques), that they assume the independence of the deviation of the model, the conclusions being eminently statistically based, despite the small size of the data samples on which they are based.

Mathematical models for determining fish growth size versus age are useful tools in day-to-day research, aquaculture and fisheries. Von Bertalanffy's growth equation (1938, 1957) for size/age is commonly used in fisheries and aquaculture research. It was found to be superior to polynomial curves for a wide range of samples developed by (Chen et al. 1992). This represents a value of the growth rate and the maximum length respectively (Xiao 1996).

Over the past 5 decades, much work has been done to parameters re-set up, test species meanings and the reliable limits of the Von Bertalanffy equation (Gallucci and Quinn 1979; Misra 1980, 1986; Sainsbury 1980; Schnute and Fournier 1980; Bernard 1981; Schnute 1981; Vaughan and Kanciruk 1982; Ratkowsky 1986; Burr 1988; Stamatopoulos and Caddy 1989;

Cerrato 1990, 1991; Chen et all. 1992; Vaughan and Burton 1994; Xiao 1994; Wanghan and Burton 1994; Xiao 2004; Wang and Thomas 1995).

However, none of the above provides a cover-up image for all species of interest or the methods necessary to establish the confidence limits of the parameters and to test the importance of differences in growth performance from size/age data.

In order to increase the accuracy of the interpretation of the biological growth of the Von Bertalanffy equation, we adopted the reathesis of Gallucci and Quinn (1979). The significance of the differences between one or more parameters of the model was tested in the probability ratio tests (Cerrato 1990) and by setting confidence limits around and around the model parameters, predictions of size and rate of growth/age (Efron and Gong 1983; Efron and Tibsirani 1993; Mooij and Van Nes 1998).

And with all the effort, I have not reached a satisfactory result with reference to the statistical interpretation of the growth factor / age applied to the batch of real sturgeons in my project.

I confess, that over 6 months, I have worked to determine the most accurate ratios between the conversion rate of food and the growth factor proven by stressful measurements for sturgeons.

I did nothing but write disappointed letters to producers of industrial fish feed and eventually receive an answer like:

"Yes, you're right... we apologize, we will study the inaccuracies reported"... and then nothing...

And, lest it be just a waste of time, the correspondences carried, we have, acquired the belief that the formulas for the administration of food proposed by the major industrial producers, only lead to an increase in the sales of those products, as long as no one speaks of the enzymatic absorption capacity and the time needed to achieve it between the tains proposed by the producers. Many tains, means short absorption times and unassimilated excess food, which will compromise the quality of the water in the growth systems. Few tains mean long assimilation times, provided that the food is sufficient and dosed exactly to the needs of sturgeons. In sturgeons the existence of that organ that holds the place of the intestine, called the Spiral Valve, complicates things a little.

It seems that I have been an extremely busy person during this period, addressing fields without specialization and once without the necessary knowledge. I've been talking to biologists, ihtiologists, veterinarians, geneticists, and I've managed to become skeptical, that I'm going to find the answers through scientific knowledge, which I've managed in a lifetime of

study to get to, and that it's probably best to go back to statistics and algorithms, which I recognize were starting to get me back more and more.

After 14 research projects on various topics but with sturgeons as a theme, I visited a veterinarian's office and saw an AFP monitoring kit, protein of what causes cells to divide and is possibly by a marker of the appearance of cancers, or benignly speaking, is identified at values of hundreds of thousands of units, in the early stages of life and even at the ovular level, following that the level of this protein to decrease, reaching a modest level at maturity.

How, I wanted to know, how to differentiate sexual sturgeons without invasive techniques, I considered the level of AFP in the blood, would be a way to investigate.

It was more difficult, with the collection of a quantity of blood, enough for laboratory tests, otherwise no hope to find out in advance the sex of sturgeons, but only during the period of sexual maturation, where the distinction is possible and morphological, because females increase in size the abdominal part.

However, this was the way forward to find out that the level of AFP is extremely different from one species to another.

At Huso, this level is kept high for the first 3 years, and will slowly decrease to 6 years, after which it enters the plateau phase.

At Acipenser Ruthenus, the decrease in AFP levels begins at the age of 3 months, and at 9 months it has already reached the plateau phase.

Even if it seems incredible, when I first looked at the graphs with the AFP values, versus age, I saw the graphs from Von Bertalanffy's equations.

Okay, but nothing is by chance and the fact that I'm ending the circle of my searches by returning to a growth algorithm with maximum cell division values at the age of 1 – 3 days, which leads to the doubling of the biological mass per day and to minimum or insignificant values, which changes the size by a sub percentage, at the age of 6 years, has given rise to a new working tool and an almost unbeatable answer to my farmers' question.

Of course, we will need to catalogue the species and the level of AFP in the future, at ages of interest, for euro-feathers projects, but at the same time for our need for biological mass and short-term growth yield, it is a welcome approach.

Even though these things for a farmer's informed eye were visible in reference to the growth factor, a very pseudo-scientific foundation was extremely welcome.

*"It is desirable to raise fish with a high AFP level at its highest values, for as long as possible, which means the guarantee of growth yield, compared to fish that have a low level of AFP and especially a shorter period of time."*

As luck is, as AFP tests have become extremely accessible, even in the veterinary field.

For an analysis it is only necessary a small amount of 12 µl of blood and great art, it is to manage to harvest and handle such a small amount.

Fortunately, the caudal vein sturgeon is quite productive, and harvesting techniques focus more on the immobilization of sturgeons.

**Conclusion**

Introducing the species of sturgeon Huso in the first year of intensive growth, we had an increase of 700% more biological mass than to a control batch of Acipenser Ruthenus fed and he intensive.

In all this, we have considered meat production and not caviar, or other by-products such as skin, cartilage or extracts, which also add value.

Sturgeons are the largest fish in Europa, with species of more than 300 kg, when they reach maturity.

If, compared to sturgeon meat there are reserves, they are due only to the ignorance, taste and qualities of this aquaculture product, it has no like. On the other hand, the selling price/kg makes the sturgeon farming activity a profitable activity, but only with brood grown in the first two years, or a maximum of 3 years. After this interval the growth rate decreases, and sturgeons grow extremely hard.

Sturgeons don't have a large audience, because reproductive material is hard to obtain, it takes years to bring these species to maturity.

And from here to the project, it was just one more step.

The increased need for biological mass, due to demographic growth and the food crisis, will lead to the search for increased efficiency and efficiency solutions in the growth of aquaculture organisms.

The yield of aquaculture will be sought in areas with large species, as only they can provide sufficient production to justify the ratio of space versus biological mass.

In fact, all over the world, research is geared towards large fish species, the only ones that can produce a large growth and a conversion of food to measure.

The project will provide you with large sturgeon saplings for breeding on Europa farms, there by ensuring a much higher yield than the usual raised species.

Sturgeons are easy to grow, both in extensive and recirculating systems. Any body of water with temperatures up to 28 degrees can be an ideal home for sturgeons if there is enough oxygen. Winters are easy to bear, if at the bottom of the basins of the farm there are deeper pits, where high-density water, such as that with a temperature of 4 C, can be layered.

Growing sturgeons is much easier than growing salmonids and telling you this knowingly.

Another business line of the project is based on the repopulation of several tens of millions of sturgeons of all river courses bordering the Black See in collaboration with partners from the countries through which these rivers pass.

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