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THE IMPACT OF THE COVID 19 PANDEMIC ON THE PRODUCTION PRICE OF CARP RAISED ON FLOATING CAGES

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Abstract

Fish is an important food in human nutrition, with high biological value, which does not produce adverse side effects, being easily digestible. In this study, it is examined how the Covid-19 Pandemic and the measures taken to limit the spread of the virus affect and transform the production costs of the carp raised on floating cages, having a direct effect on the sales price. The sector is expected to resume expansion known in 2019 over the next four years, although rising costs are a challenge to be overcome. As a result of comparison, we find a considerable increase in the production price, which is largely given by the increase in the feed price.

Key words*: aquaculture, economy, fish, management, production costs.*

INTRODUCTION

The main aim of fish culture is to produce and control production of fish and other aquatic organisms for human consumption (Diaconescu, 2003). Fish is an important part of human nutrition, healthy food, with high biological value (Anin et al., 2021).

The importance of fish farming in the global economy is related to the great potential of inland waters in the production of aquatic organisms for human and industrial consumption (FAO, 2022).

Floating cages can be placed in natural and artificial pools, being suitable for intensive fish breeding (Pricope et al., 2013).

At the beginning of 2020, the Corona-virus pandemic was declared. After the beginning of the pandemic, measures were implemented to limit the spread of the virus, which led to limiting the movement of people, goods, and increasing prices. As a result, the aquaculture sector was also directly affected (Alam et al., 2022).

With the increase in the cost of production, the profit rate decreased, because it was desired that the sale price to be directly proportional to the purchasing power. The purpose of this paper is to highlight the evolution of economic indicators during the pandemic, compared to the pre-pandemic period.

MATERIALS AND METHODS

In the present study, a comparative analysis of the economic indicators for a production of 100000 kg carp in floating cages was made. The analysed period is the period of the pandemic, respectively the year 2021, compared to the pre-pandemic period, respectively the year 2019.

In order to carry out this analysis were used indicators of effect, effort and economic efficiency, respectively production expenses, production cost, profit, unit profit and the rate of capital consumed or the rate of profit.

The following calculation formulas have been used (Niculaie & Costaiche, 2014):

- for *Unit cost (Cu)*:

$$Cu = Capm / Q \quad (1)$$

where:
Capm = production costs;
Q = production quantity.

- for *Profit (P)*:

$$P = V - Capm \quad (2)$$

where:

V = sales income;
Capm = production costs.

- for *Unit profit (Bu)*:

$$Bu = Pvu - Cu \quad (3)$$

where:
Pvu = sale price/kg;
Cu = unit cost.

- for *Profit rate (Rr)*:

$$Rr = (B/Capm) \times 100 \quad (4)$$

where:
B = benefit/profit;
Capm = production costs.

For the calculations, the euro was used at the rate of 4.9 lei (average exchange rate euro / leu in 2021).

RESULTS AND DISCUSSIONS

In order to make the comparison, the production cost was analyzed, including the following: fodder, medicines, electricity, salaries, cages maintenance, service contracts, car and boat maintenance, telephone and building maintenance contracts. In the pre-pandemic year (2019) the total expenditure was 1430051 lei (291847 euro) (Table 1), and in the pandemic year 2021 the expenses amounted to 1787947 lei (364887 euro) (Table 2).

Table 1. Expenditures in 2019 for the production of 100,000 kg of carp

Name of expenses	Calculation	Expenses value during production period	Expenses value expressed as a percentage
Fodder	190000 kg×3.6 lei (0.73 euro)	684000 lei (13959 euro)	47.83%
Veterinary drugs		7185 lei (1466 euro)	0.50%
Electricity		16800 lei (3429 euro)	1.17%
Salaries	8 fishermen×3000 lei (612 euro)/month 1 engineer×4000 lei (816 euro)/month 1 manager×4000 lei (816 euro)/month 3 guards×3000 lei (612 euro)/month 1administrator×3500 lei (714 euro)/month	462000 lei (94285 euro) (net salary) Gross salary= net salary x 40.93% 651096 lei (132877 euro) (gross salary)	45.53%
Cages maintenance		10000 lei (2041euro)	0.70%
Service contracts		9800 lei (2000 euro)	0.68%
Maintenance cars/boats	4 cars 6 boats	21000 lei (4285 euro)	1.50%
Communication		20000 lei (4082 euro)	1.40%
Maintenance of buildings and annexes		10170 lei (2075 euro)	0.70%
Total		1430051 lei (291847 euro)	

Following the total production expenses in 2021, we can see an increase of 20 percent compared to 2019, the fodder having the largest share in 2019 followed by salaries. In 2021, the highest percentage of expenses was recorded by salaries (Figure 1).
The percentage analysis indicates a 16% increase in fodder expenses in 2021, while the salary expenses register an increase of 25% in the pandemic year (Figure 2).
Keeping the upward trend, the other categories of expenses register increases of maximum 1% in 2021 compared to 2019, which have a small influence on the selling price of about 6% of the total expenses (Figure 3).

Table 2. Expenditures in 2021 for the production of 100,000 kg of carp

Name of expenses	Calculation	Expenses value during production period	Expenses value expressed as a percentage
Fodder	190000 kg×4.3 lei (0.87 euro)	817000 lei (16673 euro)	45.7%
Veterinary drugs		8000 lei (1633 euro)	0.44%
Electricity		18000 lei (3673 euro)	1.00%
Salaries	8 fishermen×3500 lei (714 euro)/month 1 engineer×4500lei (918 euro)/month 1 manager×4500lei (918 euro)/month 3 guards×3500lei (714 euro)/month 1administrator×4000lei (816 euro)/month	618000 lei (12612 euro) (net salary) Gross salary= net salary x 40.93% 870947 lei (177744 euro) (gross salary)	48.71%
Cages maintenance		11000 lei (2245 euro)	0.61%
Service contracts		10000 lei (2041euro)	0.57%
Maintenance cars/boats	4 cars 6 boats	21000 lei (4285 euro)	1.18%
Communication		20000 lei (4082 euro)	1.12%
Maintenance of buildings and annexes		12000 lei (2449 euro)	0.67%
Total		1787947 lei (364887 euro)	

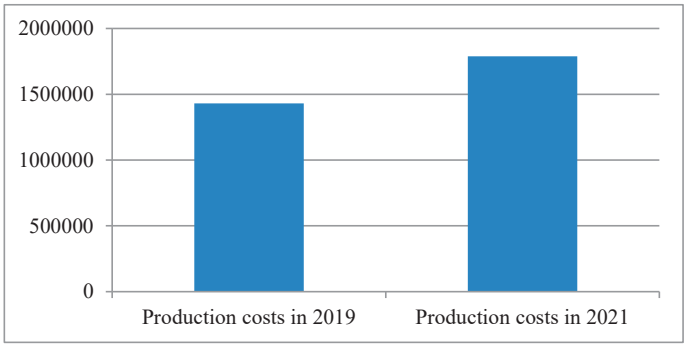

Figure 1. Analysis of production costs in 2019 and 2021

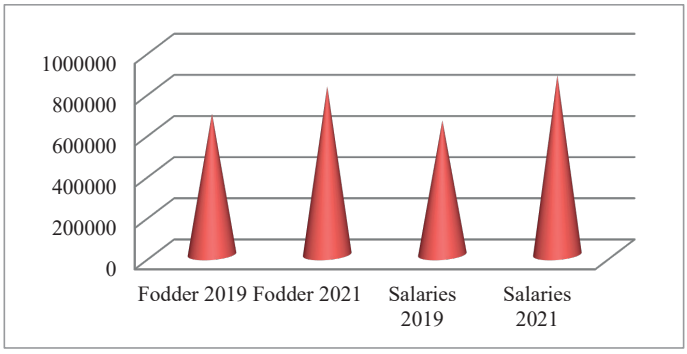

Figure 2. Analysis of costs for feed and salary in 2019 and 2021

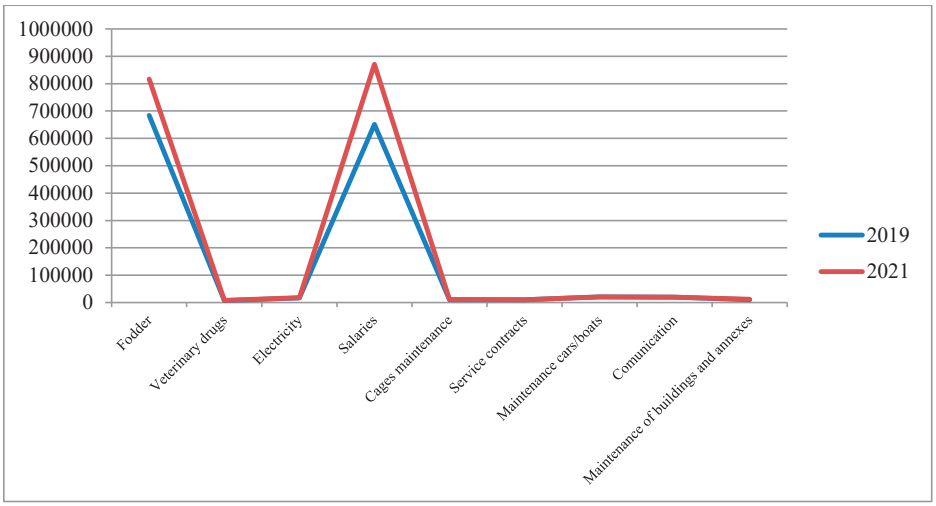

Figure 3. Other cost categories in 2019 and 2021

The income is an amount of money that a company receives from its normal business activities, usually from the sale of goods and services. The income obtained from the capitalization of the 100000 kg of carp grown in floating cages in 2019 is 1700000 lei (346939 euro), the sale price being 17 lei (3.45 euro)/fish kg, while in 2021 the sale price was 19 lei (3.88 euro)/fish kg registering an income of 1900000 lei (387755 euro) (Figure 4).

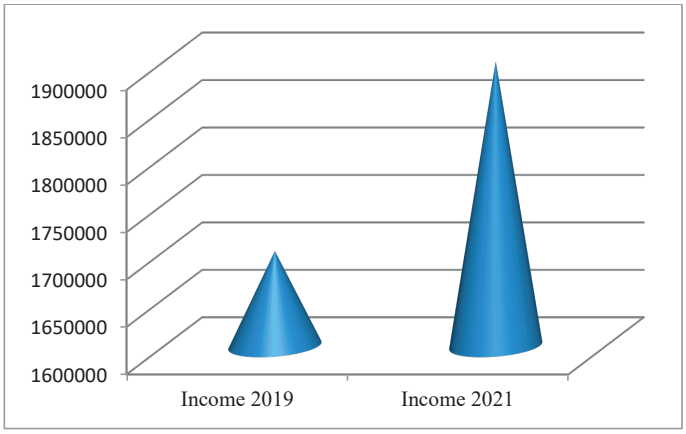

Figure 4. Income analysis in 2019 and 2021

The profit is the amount of money obtained by making the difference between the value of production of goods at sale price, and the value of production of goods at the cost of production. The profit obtained from the sale in 2019 was 269949 lei (55092 euro), representing 15.9% of the total revenues, while in 2021 there is a profit of 112053 lei (22868 euro), representing 5.9% of the total revenues (Figure 5).

By the end of 2021, there is a profit of 63% lower than the pre-pandemic year, 2019.

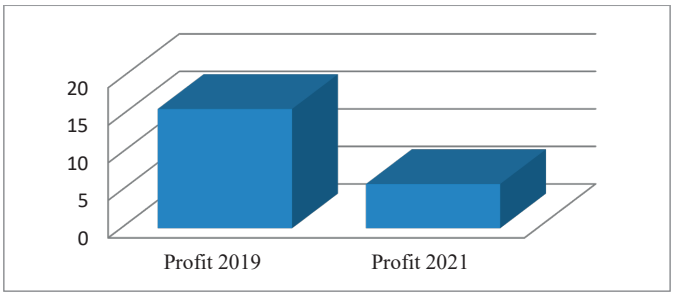

Figure 5. Profit analysis in 2019 and 2021

Economic efficiency is a notion with a complex content, which expresses the way of transformation in the production process of the economic effort performed (production costs and expenses generated by the consumption of economic resources), the resulting economic effect (quantity, quality and value of the realized production) (Table 3).

Table 3. Economic efficiency

Specification		2019 year	2021 year
Sale price/kg	lei	17	19
	euro	3.47	3.88
Price of feed/kg	lei	3.6	4.30
	euro	0.73	0.87
Unit cost/kg	lei	14.30	17.87
	euro	2.92	3.65
Profit	lei	269949	112053
	euro	55092	22868
Sales revenue	lei	1700000	1900000
	euro	346939	387755
Unit profit	lei	2.7	1.13
	euro	0.55	0.23
Profit rate %		18.9	6.26

The economic efficiency was increased in 2019 with a rate of profitability of 18.9% and a unit benefit of 2.7 lei, while in 2021 we recorded a rate of profitability of only 6.26% and a unit benefit of 1.13 lei (Figure 6).

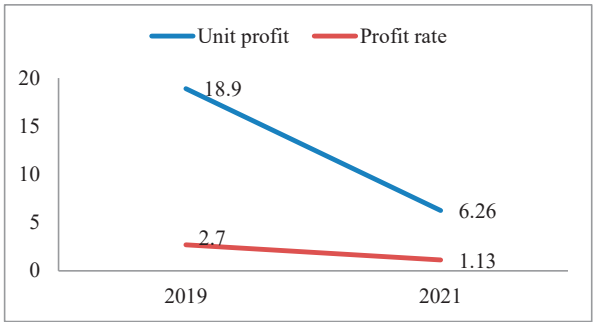

Figure 6. Economic efficiency analysis in 2019 versus 2021

CONCLUSIONS

Analysing the economic indicators of effect, effort and economic efficiency for a production of 100000 kg carp in floating cages, during the pandemic year, respectively 2021, compared to the pre-pandemic period, respectively 2019, the following conclusions can be drawn:

- The indicators of effect, respectively the production expenses in 2021 register an increase of 20% compared to 2019, an increase that is due to the increase in fodder and salary expenses.
- The effort indicators, respectively, the revenues registered an increase of 11.7% in 2021 compared to 2019, due to the increase of the selling price.
- Efficiency indicators, respectively:
  - the unit cost registered an increase of 24.9% in 2021 compared to 2019, which represents a negative aspect from an economic point of view;
  - the profit recorded a decrease of 58.5% in 2021 with 2019 a profit rate decreased by 66.9% in 2021 compared to 2019 considering the increase in expenses and the decrease in revenues;
  - the profit rate registered a decrease of 66.9% in 2021 compared to 2019 considering the increase of expenses and the decrease of revenues.

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