

ECONOMIC RESULTS OF BROILERS PRODUCTION ON THE FAMILY FARM

*Biljana Veljković, Milica Kostić, Simeon Rakonjac, Ranko Koprivica,
Marija Gavrilović, Milun Petrović¹*

Abstract: The fattening of broilers in Serbia is partially organized through contract production in small family farms that fatten broilers for the needs of large companies. The article contains an economic analysis of this small family farm, which produces about 12 000 kg of chicken meat per year on a small area of 120 m², with one family member involved all the time and other members helping as needed. Fattening broilers on the farm is organized in two ways: contract fattening up to 1 kg for 25 days and fattening up to 3.5-4 kg for 56 days. In the case of fattening broilers up to 25 days of age, on average, feed costs account for 45%, day-old chicks for 26%, and labor costs for 22%. For broilers up to 56 days of age, the largest average share is feed costs 62.4% and labor costs 26.2%. The price of fattened broilers did not change during the fattening period, so the realized production value was the same in one fattening method and similar in the other fattening method, while cost of production increased in each fattening round, which affected the reduction of contribution margin. In addition to the increase prices of feed mixtures, positive economic results were achieved on the farm, and with contract production, secure purchasing was ensured and risks in production were reduced.

Keywords: broiler chickens, costs, contribution margin

Introduction

Compared to other agricultural production, broiler production time is short, so the turnover and return on invested funds are faster. At the same time, the feed conversion ratio is good, as well as the growth of broilers. In the production of chicken meat, large-scale producers have become much more competitive in the market through intensification and modernization, so many farms have abandoned this production. In order for farms to survive in this production, they must be market-oriented or be part of the contract production for larger producers. To maintain the domestic chain of chicken meat production, family farms can supply catering facilities through agritourism

¹University of Kragujevac, Faculty of Agronomy, Cara Dušana 34, Čačak, Serbia (biljavz@kg.ac.rs)

and be part of the organic production program. Such small businesses on family farm linked to market contribute significantly to rural development.

In Serbia, 13 kg of chicken meat is produced per inhabitant, and consumption is 17 kg per inhabitant per year (Vlahović, 2015). The main reason for importing chicken meat is the lower price of imported chicken meat. In foreign trade of poultry meat, Serbia achieves a negative balance of 7.7 million USD in 2021. Whereby this deficit is even more pronounced in 2022, amounting to 16.7 million USD, according to the official data of Statistical office of the Republic of Serbia. The largest imports of frozen chicken meat come from the EU, Russia and CEFTA group countries, with the trend continuing to increase.

Farms with smaller production capacities should focus on fattening high-quality broilers, use quality feed, and have good health protection conditions. Regarding genetic potential, selection of broilers with fattening traits, faster growth and more efficient feed conversion has made significant progress. Today's broilers differ significantly from past broilers in terms of body weight, feed conversion, and carcass characteristics (Kokoszynski et al., 2017; Hurcher and Lum, 2020; Torrey et al., 2021).

For an economic production of broilers, it is necessary to match the capacities of the farm and their utilization. This is because housing conditions and stocking density per m² for broiler significantly influence production results (Mitrović et al., 2010; Salihbašić et al., 2014, Weimer et al., 2020).

It is very important that broiler chickens at a certain stage of fattening receive an adequate amount of energy, proteins, minerals and vitamins, as this ensures intensive growth and development of the broiler. With a carefully balanced meal and proper selection of hybrids for fattening under controlled conditions, good production results are achieved (Dosković, 2015).

The duration of a run in broiler fattening is relatively short, which is why Subić et al. (2010) and Jeločnik et al. (2021) recommend that farms can influence the increase in farm results at the calendar year by increasing number of fattening cycles or the number of chicken in turn of fattening.

Materials and methods

The study was carried out on a family farm, which has many years of experience in fattening chickens and is located near Vrnjačka Banja. The capacity of the poultry farm for fattening is 1000 chickens up to 1 kg and 650 chickens up to 3.5-4 kg. For 7 years lasts, the contract production of service fattening of broilers Cobb500 up to 1 kg has been running with a large

company, with which the farm successfully cooperates. The broilers weighing 3.5-4 kg are fattened on the farm for 56 days and are intended for regular customers. The farm strives to meet the needs of its customers and organize more cycles of fattening during the year. The family farm with an area of 10 hectares also grows forage crops, which is in the function of livestock, other types of agricultural production are also represented, and broiler chicken fattening is only one of them. One member of the household is constantly engaged in fattening the chickens, and the other members help when necessary.

In this family farm, chicken fattening was investigated in 2021. The study included both methods of fattening with three cycles of fattening each. The organizational and technological processes in production were monitored, costs were recorded, and calculations were made. The economic profitability of production was determined using the method of calculating the coverage of variable costs. That is calculating the contribution margin as the difference between the realized production and the amount of variable costs (Subić et al., 2010; Jeločnik et al., 2021). The input prices for each fattening cycle were recorded, and were given calculations of the contribution margin in which the realized economic results were calculated.

Results and discussion

The floor system for broilers production is carried out in facilities with adequate insulation and partially mechanized equipment, with part of the work done manually. Chickens are reared on a deep litter with manually refilled feeders that hold 11 kg of feed and are adjusted to the age of the birds during production. The waterers are partially mechanized and are refilled daily with fresh water to which vitamins and medicines are added according to technological requirements. The combination of ventilation and heating, as well as the control of the drinkers, maintains the required humidity in the room at about 70%. Depending on the months in which fattening is carried out, the ventilation and heating of the poultry house is adjusted. During each cycle of fattening, day-old chicks are housed in a clean, disinfected and well-heated room with a dry litter. Day-old chicks are very sensitive and must be provided with the required temperature and appropriate conditions. During fattening, the condition and behavior of the chickens are monitored to produce healthy individuals.

In broiler feeding, feed mixtures are used, i.e. Starter, Grover I and Grover II. In performance fattening according to the technology of controlled fattening,

feed mixtures are purchased from the company, namely initial feed with 22% crude protein and full feed with 19% crude protein. For longer fattening tours, feed mixtures with 17% crude protein are used. For conversion of feed for fattening up to 1 kg, 1.5 kg of feed is consumed. For fattening broilers with an average weight of 3.5-4 kg weight, 7 kg of feed is consumed. After three weeks of fattening broilers reach a weight of 1 kg. Service fattening of 1000 broilers is completed, the company picks them up and brings them to the desired place. On the farm remain 650 broilers and are fattened for up to 56 days. When they reach the desired weight, they are slaughtered, cleaned, washed, packed and delivered to customers.

The calculation of costs and contribution margins for the service production of fattening up to 1 kg in all three cycles is shown in Table 1. The contracted price for one broiler chicken was 220 dinars or 1.86 EUR and did not change in all three cycles of fattening. In the calculation of income, manure is added as a by-product, and on average about 2 tons are obtained per round. Due to the low capacity of broiler fattening, the farm does not receive subsidies for this production. During the observed period, costs for all three fattening cycles increased by 11%, energy costs were in low growth, which affected the reduction of contribution margin, which was the lowest in the third fattening pass, 340 EUR. The average share of feed costs for all three cycles of fattening is 45.3%, and these are also the largest costs. Day-old chick costs are represented with an average share of 26%, labor costs with 22%, and followed by other costs with a lower share (Table 1).

Table 1. Calculations of the fattening cycle of broilers up to 1 kg for 25 days

Production value	Fattening I	Fattening II	III Fattening	Schare in %
Fattened broilers	1865	1865	1865	97.8
Manure	42	42	42	2.2
Total income	1907	1907	1907	100
Costs				
One-day chicks	398.3	398.3	398.3	26
Feed	654.2	703.4	728.2	45.3
Medicines	25.4	25.4	25.4	1.7
Energy sources	29.7	33.9	33.9	2.2
Straw and others cost	16.9	16.9	16.9	1.1
Veterinary services	16.9	33.9	25.4	1.7
Labor costs	339	339	339	22
Total costs	1481	1551	1567	100
Contribution margin	426	356	340	/

Labor costs were calculated for one worker employed per day during the 25 days of the fattening shift. The average variable cost in the total calculation was 1.53 EUR per broiler. Contract fattening with a large company eliminates for the farm the cost of transporting day-old chicks, feed mixture and fattened broilers, as well as the risk of repurchase, i.e. sale.

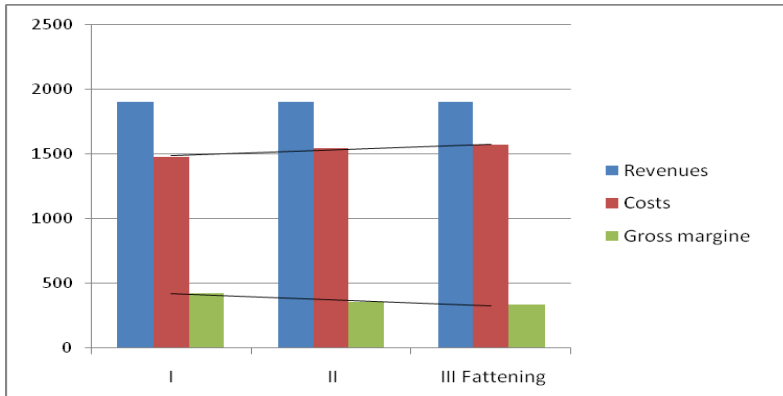
The calculation of cost and contribution margin of the extended fattening of 56 days for own customers for all three runs is shown in Table 2. The selling price of fattened broilers has not changed in all three fattening passes and is 280 dinars per kg or 2.37 EUR. Approximately 3 tons of manure are produced per fattening cycle, the value of which is included in the income. Due to the increase in feed prices with each new fattening cycle, feed costs increased. More feed was used in this type of fattening, so the average share of feed costs was 62.4%. Labor costs had an average share of 26.2% and were calculated for a worker employed for 68 days in one fattening cycle. The lowest contribution margin of 1 734 EUR was obtained in the fattening round III (Table 2). The average variable cost in the total calculation was 5.53 EUR per broiler.

Table 2. Calculations of the fattening cycle of broilers up to 3.5-4 kg for 56 days

Production value	Fattening I	Fattening II	III Fattening	Schare in %
Fattened broilers	5382	5363	5369	98.8
Manure	64	64	64	1.2
Total income	5446	5427	5433	100
Costs				
One-day chicks	259	259	259	7.4
Feed	2059	2169	2366	62.4
Medicines	25.4	25.4	25.4	0.7
Energy sources	76.3	67.8	84.7	2.2
Straw and others cost	25.4	16.9	25.4	0.6
Veterinary services	25.4	16.9	16.9	0.5
Labor costs	922	922	922	26.2
Total costs	3392	3477	3699	100
Contribution margin	2054	1950	1734	/

Both calculations showed that food costs have a large share in variable costs, which is in line with studies by other authors (Veljković, 2015; Horne, P.L.M. van, 2018)

The interdependence of the obtained economic results from the calculations for the first fattening method is shown in Graph 1.



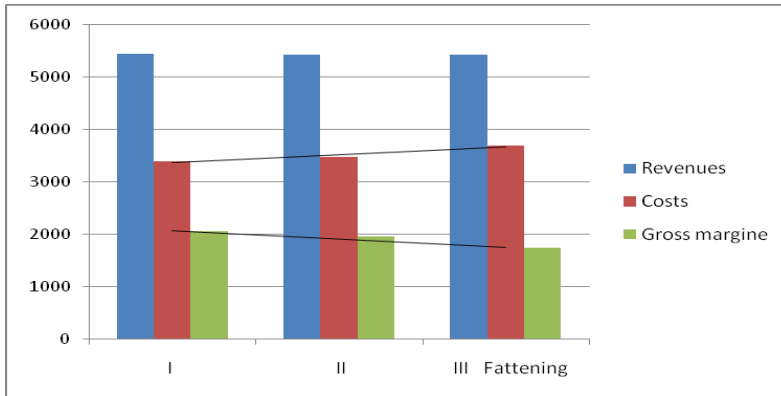
Graph 1. Economic results of realized fattening up to 1 kg for 25 days

The incomes in all three fattening cycles did not change, and the contract price for fattened broilers was the same. The increase in feed prices also increased the cost of production, resulting in a 21% decrease in the contribution margin in the fattening round III. In the first fattening method, the realized contribution margin in relation to the realized production value is on average 19.5%.

A comparative overview of the economic results obtained for the other type of fattening is shown in Graph 2. The incomes in the fattening cycles showed slight variations, considering that the weight of the fattened broilers varied between 3.5 and 4 kg, while the prices of the live weight of the broilers were the same. Feed prices increased during fattening and the contribution margin decreased by 16% in the round III. In terms of realized production value, the contribution margin averaged 35.1%.

The decrease in contribution margin in both fattening methods was due to an increase in variable costs, especially feed costs. The contribution margin is sensitive to the increase in prices for concentrate mixtures, and if broiler feed prices continue to increase, production would no longer be economically viable.

The contribution margin should also cover fixed costs, which are not included in these calculations. In the studies by Subić et al. (2010) and Jeločnik et al. (2021), it was shown that the contribution margin is extraordinarily sensitive to changes in fatten broiler prices and if be eventual decrease would lead to negative economic results.



Graph 2. Economic results of realized fattening up to 3.5-4 kg in duration of 56 days

From the comparison of these two types of fattening, it can be concluded:

- In the first type of fattening, the obtained contribution margins are lower, but the fattening takes short time and the risks are minimal. The observed family farm takes advantage of all the benefits it can obtain from contract production.

- In the second type of fattening, the investments are higher, the contribution margins are higher, the fattening lasts longer and there are greater risks in selling and placements.

The decision on the profitability of production is made on the farm itself, taking into account all the production parameters presented. So, the farm should weigh and make the best decision on what is more profitable for them. In the case of this study, both fattening methods were combined.

Conclusion

The agricultural sector of the European Union has been developing for many years under the conditions of a stable agricultural policy and with high state subsidies. In Serbia with agricultural production in small farms solves the current social problems and employs at least one family member, which are short-term solutions that are hardly comparable. Under these conditions, domestic production is less and less competitive on the market. Because of their low capacity, family farms are not recognized for receiving government incentives and subsidies, so they must seek this type of support under rural development. Farmers of fattening broilers also face such problems.

For this reason, some agricultural producers in search of alternatives in production develop family business. Thus, in addition to tradition and inherited way of life, agriculture is increasingly becoming a financially profitable business. These family farms orient themselves to the market, find steady buyers for their products and conclude production contracts with business partners.

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