PRODUCTION OF PORK ON PIG FARMS WITH MINIMAL PRODUCTION COSTS

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Abstract
The study deals with the analysis in the development of pork production, as and the economic analysis of the farmer in the production conditions of the pig breeding farms in the Republic of Serbia. The survey included a cooperative farm "1. December "in Žitorađa in Toplič District. In 2016, technology was monitored production of farmer at the farm, and analyzed economic results in production. During the observed period, it was found that 35,442 heads were farmed at the farm. The price of a 100 kg per 100 kg cost was 132 euros, while pork meat in half-carcasses cost 1.84 euros / kg. The average weight of the hemisphere on the farm is equal to about 78.5 kg. The proportion of pig meat in the hemisphere varies from 79% to 78%.

Keywords: breeding, price, pork, costs, profit.

Introduction

Regardless of what the natural indicators in intensive, market oriented production of pigs are, it is very difficult to provide a detailed insight into the production cost of fattened pigs, which represents the research basis of the paper and proof that the pig production process is cost effective. Mičić, (2016a) determines that with an increase in the number of piglets per sow from 10 to 20, the production cost per piglet reduced by 79.09%, while cost per sow increased by 11.67% per annum. Increase in the genetic basis of pigs represents a necessary precondition for the achievement of greater intensity in this branch of livestock production.So Vidović et al. (2012) report that the annual genetic progress for average daily growth was 8-11 gr, food conversion from 0.03 – 0.05 kg as well as 0.35 – 1.00% for the content of meat in sides. Based on previous research and results in practice there is opinion that betterresults can be expected in due time as follows: 30 fattened pigs per sow per year, conversion of food bellow 2 kg, less than 120 days of life to reach 100 kg of body weight, daily gain of live weight of about 2 kg. Mičić, (2016b) states that the characteristic of breeds of pigs as well as individual characteristics of livestock to achieve greater daily weight gain, greater amount of meat and better carcass yield in same growing conditions are of great significance to successful and cost-effective pork meatproduction. By better use of these properties the fattening period is reduced and at the same time total production is increased. Živković, Perunović, (2012) state that pork meatproduction in Serbia is characterized by the increasing participation of large farms (10,000 to 30,000, and more fattened pigs per year), and quality of pigs has significantly increased, especially on farms, and it can be said it is approaching the European average. Pork meatproduction is carried out by determining production cost of 1 kg, produced pork meatsides in first and second phase. Research of the economic parameters of producing fattened pigs deals with costs in the first phase of the production process and determining total cost of producing pork meat sides in the second phase, by the division calculation method. This allows for the given results to have common, rather than only local significance Andrić, (1998).

Research goal

Research goal: During research and proofing, the scientific method is primarily used, whose basic application allows an explanation and prediction of the relationship between individual relevant inputs and results of the achieved effects in the production of pork meat. In accordance with the strategy of developing pigmeat production. The aim of the research is to improve the quality of pig meat production from noble pure races erected on the farm. During The preparation of this work was used data from multiple sources. The data was used the amount of production, analysis of pig and pig production in the long run period. An analysis of this data would not have been possible if it had not been approved and farms and data were processed by mathematical-statistical methods.

Material and methods

The survey was conducted at the cooperative farm "December 1st" in Zitoradia. The farm has an indoor production cycle that involves the production of piglets. At the farm they produce about 35,442 livestock a year. At the farm, 80 people are employed with appropriate qualifications. Farm production costs on the farm are based on natural indicators based on surveys carried out in 2016 and all costs of variable categories according to the production process. Material costs refer to the consumption of nutrients and medicines used in the production process. Depreciation costs cover 2016 based on the standards of required space and equipment, access to investment estimates, estimates of depreciation costs based on which the categories of fixed costs are calculated. In determining production costs, we begin with the price of pigs, the weight of slaughtered pigs, the variable costs of slaughter and cooling. The results of production on the farm relate to a period of one year (2016). The following are the production parameters: food consumption per 1 kg of growth, total growth and food costs per farm for one year.

Results and discussion

Starting from previously highlighted facts and characteristics of pork meat production strategy:

- Production of fattening pigs on the farm,
- Characteristics of pig meat quality on farm.

In addition to theoretical explanation and application in general examples, we has shown the optimal feeding efficiency for an example of a nutrient mixture for Fattened pigs on the farm. Production costs and deaths of pigs on farm are based. The calculation of fixed and variable costs was calculated on the holding in accordance with the production process. Also included are costs related to consuming nutrients and drugs used in the production process, as well as livestock depreciation, existing space and equipment.

Pricelist of mixture for feeding pigs on farm

During the calculation of the price of a mixture for pig breeding, the prices of all products, calculated in tonnes (t), were taken into account. More information about this is shown in Table 1. The price list of the concentrate mixtures at the feeding farm of pigs of all categories is shown in Tab. 1. The Farm has its own blenders that operates independently and is located by the entrance gate and by the above mentioned pricelist of mixture entrusts farm.

Productivity of sows and upbringing of piglets on farm

Farm has 1,500 sows Landrace + Yorkshire which had two farrowing a year in the average of 10.3 raised piglets per breed, i.e. 20.6 piglets a year. Piglets are weaning after 28 days with the average body weight of 6.6 kg. Their upbringing lasted 34 days after that up to body weight of 25 kg, with the achieved daily growth of 0.54 kg a day. More data on productivity of sows and raising piglets on farm is given in Table 5.

Table 1. Price of concentrate mixture on farm

PRICELIST OF FEED MIXTURE FOR PIGS ON FARM 1. DECENBAR IN ŽITORAĐI IN SERBIA IN 2016		PRICE EUR/kg
Pre-starter mixture for feeding piglets to 10kg	(PS)	0.48
Grovermixture for feeding piglets from 15 to 25 kg	(SS)	0.34
Startermixture for feeding piglets to 15 kg	(SG)	0.33
Mixture for feeding fattened pigsfrom 25 to 60 kg	(TS-1)	0.28
Mixture for feeding fattened pigs from 60 to 100 kg	(TS-2)	0.26
Mixture for feeding pregnant gilts and sows	(SK)	0.25
Mixture for feeding lactating sows and boars	(SKD)	0.29

Source: Authors' calculation based on data from Mičić, 2016

Table 2. Productivity of sows and raising piglets up to 25 kg on farm in 2016

I	REVENUE	Number of livestock	kg/ livestock	Total/kg	Price unit	Total €
1	Raising piglets put for fattening:	35,442				
2	Average end weight of piglets:	30,000	25	750,000	2.39	1,792,500.00
3	Manure (sows)total	1,500	500	750,000	0.01	7,500.00
A	T o t a l (1 to 3)					1,800,000.00
II	EXPENSES					
5	Feeding piglets/ mixture according to pricelist Table 1					
6	-pre-starter (0.2 kg /day x10days x30,000 pigs)	30,000	2	60,000	0.48	28,800.00
7	-SP1 (to 15 kg) (0.6kg /day x11days x30,000 pigs)	30,000	6.6	198,000	0.34	67,320.00
8	-SP2 (15-25kg) (1.8 kg /day x13days x30,000 pigs)	30,000	23.4	702,000	0.32	224,640.00
9	Feed to sow (4.5kg/day x46days x1,500 pigs)	1,500	207	310,500	0.28	86,940.00
10	Feeding a sow (4.5 kg/day x365days x1,500 pigs)	1,500	1,642.5	2,463,750	0.26	640,575.00
11	Feeding a boar (4 kg/day x365days x25 pigs)	25	1,460	36,500	0.26	9,490.00
B)	Total feed (5 to 11)		3,341.5	3,770,750		1,057,765.00
12	Loss in fattening piglets 2%		-	-		36,000.00
13	Under vacuum	30,000			1.00	30,000.00
14	Water and medicine – sow and boars	1,525	-	-	20.00	30,500.00
15	Human labor (personal someone else's)	working day		365	400.00	146,000.00
16	Depreciation of pigs (450 -150=300x20%)	1,525	-	-	60.00	91,500.00
17	Depreciation of facilities and equipment			1,449,275	3%	43,478.00
18	Total direct costs*(5 to 18)*					1,494,718.00
19	Indirect costs of the farm					93,559.00
C)	Total costs*(18 + 19)*					1,528,802.00
III	PROFIT/LOSS					
20	On a farm without incentive(A – C)					271,198.00
21	Per pig without incentive (20 : 3)					180.79
22	Price for kg (C : 2)					2.04
23	Production efficiency (A : C)					1.18
24.	Revenue profitability (20 : A) x 100					15.07%

Source: Authors' calculation based on data from Mičić, 2016

Livestock Number on farm 1,500, *Lowland region,*Racial compositionLandrace +Yorkshire, Entrance weight, Fattening weight in years (two cycles), Exiting weight 25 kg, Average 20.6 piglets/pig a year, Weight of a piglet after weaning 6.6 kg, Age of piglets after weaning 28 days, Raising piglets 34 days x 0.54 kg/day

From Table 2. it is visible that breeding sows-piglets on farm has the gain from 271,198 €, efficiency is 1.18 and revenue profitability is 15.07 %. Table 3, shows achieved economic indicators in fattened pigs on farm in 2016.

Table 3. Achieved economic indicators in fattened pigs on farm

1.	Production year: 2016	Amount	Conversion rate of feed inkg:			3.21	kg/growth
2.	Fattening period:Jan-Dec	Unit of Measure	Mortality rate of fattened:			2.0%	
3.	Number of pigs put for fattening:	30,600	livestock				
4.	Average weight of a fattene pig:	100	kg / livesto				
5.	Length of fattening:	98	Days				
I	Revenue	Unit of Measure	Unit of measure	Price	Unit of measure	Amount total	Amount€/ livestock
6.	Fattened pigs*(4 x 6)*	30,000	livestock	1,58	€/kg	4,740,000.00	158.00 €
7.	Manure	15,000	t	4,00	€/t	60,000.00	2.00 €
8.	Subventions per pig	30,000	livestock	8,70	€/ livestock	261,000.00	8,70 €
A)	Total revenue *(1 do 8)*	-				5,061,000.00	168.70 €
II	Expenses	-					
9.	Piglets (average/pig)	25.0	kg/ivesck				
10.	Piglets*(3 x 9)*	765,000	kg/ livestoco	2,04	€/kg	1,560,600.00	52.02 €
11.	Farm is has the mixture according to priceli						
12.	TS1 (from 25- 60 kg) 2.35kg/dayx46days x30,000 pigs			0,28	€/kg	908,040.00	30.27 €
13.	TS2 (from 60-100 kg) 2.55kg/dayx52days x30,000 pigs			0,26	€/kg	1,034,280.00	34.48 €
14.	Average daily per livestock	2.46	kg/EUR				
15.	Mechanical work *(6 x 15)*	-	kg/EUR	1,497	€/kg	44,901.00	1.50 €
16.	Water per livestock *(16 x 5) x 6*	10	L /day	1,15	€/m^3	33,810.00	1.12 €
17.	Veterinary services and medicine *(6 x 17)*			0,80	€/ livestock	24,000.00	0.80 €
18.	Human labor*(4x6) x 18*		kg/EUR	0,18	€/ livestock	540,000.00	18.00 €
19.	Indirect costs *(6 x 19)*		kg/EUR	1,00	€/ livestock	30,000.00	1.00 €
20.	Depreciation of facilities and equipment *(6 x 20)*			3,53	€/ livestock	105,900.00	3.53 €
B)	Total costs*(9 to 20)*					4,281,531.00	142.72 €
III	PROFIT/LOSS						
21.	On farm with incentive *(A – B)*					779,469.00	25.98 €
22.	Cost perkg*B :(4 x 6)*					1.42	
23.	Production efficiency*(A : B)*					1.18	
24.	Revenue profitability (21 : A) x 100				%	15.40	

Source: Authors' calculation based on data from Mičić, 2016

From Table 3. we can see that total achieved gain for 30,000 fattened pigs is 779,469.00 EUR, production efficiency 1.18 and revenue profitability is 15.40 %.

Productivity of pig production on fauna in 2016

In order to investigate the efficiency of production, the farm from Serbia has been taken into account because it has the necessary conditions for such production. We have been researching a farm with 35,442 cattle. The average input weight of the piglets for fattening was 25 kg and the output weight was 100 kg. At the farm, the average pig breeding time was 98 days with a daily gain of 0.76 kg / day. Our results are consistent with the results (Vidović et al., 2012) in the performance test for pure breeds of pigs, landrace and Yorkshire. Income calculation includes only the proceeds from the sale of pigs, while the potential income from pork is not taken into account (Table 4).

From the data presented, it can be seen that the price of pork on the farm is 1.94 EUR / kg and that this production has an efficiency of 1.45 and a profit profit of 31.16%. Furthermore, it can be seen that in the farm, the calculation of the costs of slaughtering, cooling and processing of pigs is 8,70 EUR per head. The calculation was carried out in accordance with the achieved yield of slaughtered pigs, the value of live pigs of 100 kg. After the research, we answered a few very important questions in the work: the price level is not such as to stimulate pig breeders and prices affect the level of production. One of the reasons is the reduction and stopping of the slaughter of large industries in the Republic of Serbia. At the same time, the expansion of large private slaughterhouses, which are far more flexible industries, makes their production far more efficient.

Table 4. Economic indicators of pigmeat production - at the farm in 2016

I	Indicator	Unit of measure	Farm
A.	Fresh pork meatsides	livestock	30,000.00
B.	Livestock weight of live pig weight	kg	100.00
1.	Total weight, pig(AxB)	kg	3,000,000.00
2.	Pork sides/livestock	%	78.00
3.	Total pork/sidekg (1 x 2) : 100	kg	2,340,000.00
4.	Price of pork sides	€ /kg	2.82
V.	Total revenue (3 x 4)	€	6,598,800.00
II	EXPENSES		
5.	Price of the slaughter service	€/livestock	8.70
6.	Direct costs of live pig weight	€	4,281,531.00
7.	Total pig slaughter service (Ax 5)	€	261,000.00
G.	Total expenses(6 + 7)	€	4,542,531.00
III	PROFIT/LOSS	€	
8.	Pork sides from farms (V - G)	€	2,056,269.00
9.	Pork side livestock/EUR (8 : A)	€	68.54
10.	Pork side pricekg (G : 3)	€	1.94
11.	Meat production efficiency (V : G)		1.45
12.	Revenue profitability (8 : V) x 100	%	31.16

Source: Authors' calculation based on data from Mičić, 2016

Conclusions

Another argument in the request for determining the price of fattened pigs on the line of slaughter is to give quality according to meat share, which can be seen in the research on the a pig farm, that it is best to close the whole production.

-The calculation was made on the farm in accordance with the yield of slaughtered pigs, and the value of live pigs weighting 100 kg is 142 euros + slaughter costs of 8,7 euros, which amounts to 150,70 euros, and given that the chilled side of the pork meat is 78 kg at the price of € 2.82 per kg, value of livestock (side) is 219.96 €.

-Slaughter slaughterers received pig meat with uniform weight, on average 78 kg per livestock. Farm realized profit in the amount of EUR 2,056,047.

-It can easily be concluded that the price of the cooled party is 45.96% higher than the price of the pig. We have come up with new scientific discoveries in the paper on the practical application of quality nutrition in fattening pigs.

-The advantages of this method of pig breeding and the scientific contribution to the promotion of the development of pork meat production have been examined, for which Serbia with the tradition of pig breeding has great geographical and ecological potential, especially in its agricultural and livestock production.

-As a final conclusion of the survey, farmers can be recommended for breeding pigs to organize production groups, cooperatives, clusters and franchises.

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