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COMPARISON OF ECONOMIC CHARACTERISTICS OF PORKERS OF MANGALITSA AND YORKSHIRE RACE¹

Vladislav Zekić, Vladimir Tomović, Dragan Milić, Dragomir Lukač²

Summary

The aim of study was to compare the economic characteristics of production of porkers Mangalitsa and Yorkshire race. The observed productions should provide the raw material for the production of traditional fermented sausages, or specific products with protected origin. According to this a calculation is derived with the total cost of fattening pigs Mangalitsa and Yorkshire race to the slaughter weight of 132 pounds under the conditions of modern farm housing system. The above calculation includes the cost of materials, the cost of energy and external services, salary costs and amortization of facilities and equipment used. In this way we can get to the total costs of finishing of pigs produced per kilogram of live weight without the overhead costs. The costs are calculated as described above for Yorkshire race and it is 120.88 RSD/kg or 1.26 €/kg and it is lower than the current purchase price in the market. On the other hand the costs of finishing Mangalitsa race are significantly higher than the purchase price of pigs bred races and it is 245.19 RSD/kg or 2.13 €/kg, which is caused by a slow weight gain and inefficient feed conversion compared to the refined race.

Key words: pig farming, Yorkshire, Mangalitsa, costs

JEL: O13, Q12

Introduction

Pig farming in Serbia is based on the use of the latest achievements in biotechnology and the use of highly specialized breeds of pigs (Vidović et al., 2011). This production has a long tradition. During the 19th century, pigs were the main export product of Serbia. Then the pig

- 1 These results are part of the project no. 114-451-2091/2011 (Improvement of meat quality from indigenous and modern pig breeds produced in Vojvodina for the production of traditional dry fermented sausages and dry cured meat products). Research was financially supported by the Provincial Secretariat for Science and Technological Development, Autonomous Province of Vojvodina, Republic of Serbia.
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farming was based on domestic indigenous races with the dominant one, Shumadinka. This type of pigs was crossbred on the farm Kis Jenó with races such as Bakonyi and Szalántó, which led to the establishment of a special breed of pigs called Mangalitsa. Due to the extreme moderation and resistance it was widespread in Vojvodina (especially Srem) and Hungary to the fifties. Today, in Serbia there are three indigenous breeds of domestic pigs Mangalica, Moravka and Resavka while Shumadinka and Shishka were lost in its original form. There are three strains of Mangalitsa in Serbia: lasa (Srem black lasa or Budanovacka pig), white and Subotica strain (Gajic et al. 1997). In Hungary and Romania the so-called ginger strain also appears. Recently, there has been a growing interest in indigenous race, not only to preserve the gene, but also for the production of meat products in the traditional way. Mangalitsa is typical greasy pig breed whose hemispheres consist of 65 - 70% fat and 30 - 35% meat (Egerszegi et al., 2003), which is sufficient for the production of high-quality hams and other products. The results of other studies (Szabo, 2001, 2002 - Egerszegi et al., 2003) show that less than 40% of lean meat in the carcass, which is sufficient for the production of high-quality hams and other products.

Breeding indigenous race is condition for the creation of raw material for the production of the special characteristics of food products, or products with geographical indications. Development and production of traditional products with protected geographical origin enables better visibility and positioning in the market and higher profits. The value of geographical indications is based on the belief that consumer products are marked with the mark of origin and quality of special properties. In this way, the competitiveness of these products increases significantly, achieving a market advantage compared to the same type of products that do not have such a label. Regardless of the long-term survival in the presence of specific market conditions and permanent characteristics of certain products which can be achieved only by creating a stable source of raw materials. This method allows the conditions for organic livestock production and potency open for utilization of its potential (Katic et al, 2010).

Intensive farming and one-sided selection resulted in, among other things, the big difference between Mangalitsa and noble race. Mangalitsa is mostly the result of natural selection and the conditions of rural households that were not adhered to conventional veterinary preventive and curative since the species itself is extremely easy to hold. In extensive breeding have needs for simple shelter from the rain and snow, which is especially true for pregnant animals. It needs to take care of the basic conditions to hold, otherwise it could get to cannibalism or inphantophagy by other animals. Their requests for food are humble, but they are looking for diversity, what in free grazing is not a limiting factor. They exploit good what they find in nature, and with the addition of concentrated food and space limitation are subject to extremely fattening and accumulation of body fat, where older animals reach a weight of 200 kg or more.

Materials and methods

The study of economic parameters of fattening pigs, pigs Mangalitsa and Yorkshire breeds as a raw material for the manufacture of products with protected origin is based

on the determination of the total production cost. Costing calculation is performed for fattening up weight of 132 kilograms. Determination of the cost or certain categories of expenses is based on natural indicators examined farms. Research production traits were studied on farms where Mangalitsa (M) and Yorkshire (Y) are produced in the period between 2009 and 2012. The presented data refers to 432 litters of Mangalitsa and 675 litters of Yorkshire breed.

In addition, taking into account the fact that individual farmers do not have adequate documentation of investments in fixed assets, access to their assessment, in order, based on the estimated value, to calculate amortization and maintenance costs (Marko, et al., 1998). In this way, it allows the results to be of a general and not only local significance.

Results and Discussion

When examining the observed farm-based research sample and in line with established product data sufficiently describe the production of both races. In the first phase was analysed reproduction of the both races and the determined values are related to litter size and give in Table 1. Presented data clearly show significantly better reproductive traits of Yorkshire breed compared to Mangalitsa.

Table 1. Phenotypic differences for litter size

No	Traits	Yorkshire		Mangalitsa	
			δ		δ
1	Alive born	12,1	2,8	7,2	2,6
2	Weaned	10,6	2,7	6,8	2,7
3	Alive born/sow/year	24,2	2,6	12,96	2,9
4	Weaned/sow/year	23,4	2,6	12,18	2,8
5	Finishers/sow/year	22,6	2,8	12,12	2,9

Source: own research

Second phase of the study has determined the size of the related production traits, that weight gain and feed conversion for each of the race. In this case, obviously is much better productivity Yorkshire breed which is consistent with previous studies (Zekic et al, 2009). Comparative overview is given in Table 2.

Table 2. Phenotypic differences for growth and feed conversion

No	Traits	Yorkshire		Mangalitsa		Differences
			δ		δ	
1	Life gain to 100 kg (g)	579	154	203	160	376**
2	Life gain up to 132 kg (g)	584	160	242	160	341**
3	Age at 132 kg (days)	227	12	540	24	- 313**
4	Feed conversion (kg)	3,1	0,9	5,2	1,3	- 2,1**

Source: own research

Most of the material costs are the costs of food. Costing provides for the use of three types of concentrates with production carried out on the same farm. Fattening of weaned piglets begin with concentrate with 20% protein. During fattening the protein in food is gradually reduced so that the fattening ends with concentrate containing 14% protein. For feeding breeding stock animals is provided a special mixture of nutrients. Review of types of concentrate used during the fattening period and cost of materials consumed for their production is given in Table 3.

Table 3. Production price of the used concentrate

No	Feeding period	Price (RSD/kg)
1	To 25 kg	50,84
2	From 25 to 132 kg	36,00
3	Basic bevy feeding	44,11

Source: authors' calculations

Calculation of costs of fattening pigs to the weight of 132 kilograms is divided into two phases and corresponding stages of the technological process of production of fattening pigs. The first stage involves the calculation of the production costs of pigs, while the second phase is related to the fattening costs. Calculation of costs in piglet production takes into account the costs of food for pigs, veterinary services, heating costs and losses of piglets. The calculation of production costs of Yorkshire piglets' race is shown in Table 4.

Table 4. Calculation of piglet price Yorkshire race

No	Cost type	Quantity	Price (RSD/m.u.)	Total (RSD)
1	Piglet food	47,60	50,84	2.419,98
2	Food for sows and boars per piglet	47,01	44,11	2.073,42
3	Veterinary services			224,67
4	Loss of piglets			155,70
5	Total			4.873,77

Source: authors' calculations

The same methodology was performed for the calculation of production costs of Mangalitsa piglets' race and it is shown in Table 5.

Table 4. Calculation of piglet price Mangalitsa race

No	Cost type	Quantity	Price (RSD/m.u.)	Total (RSD)
1	Piglet food	85,00	50,84	4.321,40
2	Food for sows and boars per piglet	90,29	44,11	3.982,88
3	Veterinary services			415,21
4	Loss of piglets			523,17
5	Total			9.242,66

Source: authors' calculations

The calculation of the total costs of fattening pigs, as a second stage in the calculation, is based on the production prices of piglets and continues to all other costs incurred in the process of fattening pigs' average weight of 132 kg. Fattening pigs and the calculation are performed up to a weight that is greater than the standard since the production of traditional fermented dry sausage and dry meat products demands meat whose properties differ from properties that come on the fattening weight of 105 kg.

The calculation of the total costs was based on previously collected data, which are common on the farms. In addition, the corrections of costs are derived and their compliance with the standards for the appropriate category.

The calculation of the costs of production of fatteners is derived by different races. Overview of the total costs of Yorkshire porkers is shown in Table 5. The first category of costs makes the production price of fattening pigs. The size of the calculation assumes the production of piglets for fattening and the first item is the input cost in the production of fattening pigs.

Table 5. Calculation of total cost per fetling Yorkshire race

No	Expenses	UM	Price (RSD/UM)	Quantity (kg)	Value (RSD)
1	Piglets for fattening	kg	194,95	25	4.873,77
2	Food for fattening	kg	36,00	238	8.568,00
3	Veterinary services				67,21
4	Water				70,00
5	Electricity				120,00
6	Amortisation of the equipment and basic bevy				1.313,85
7	Salaries				874,53
8	Fattening losses				68,49
9	Total expenses				15.955,85

Source: authors' calculations

The second category is the cost of feed. The quantities expressed in the calculation were determined on the basis of norms of consumption of these nutrients for the reference category of the manufacturing sector. The total amount of food to feed fattening pigs from 25 to 132 pounds of body weight is 238 kg. The third category consists of calculation of costs of veterinary services. This category was calculated based on estimates of the costs to 0.5% of total actual cost of growing and eating of piglets in the fattening stage. The fourth category consists of the costs of supplying water to farms in the calculated amount of 70 dinars per head, while the estimated costs of electricity amounted to 120 dinars per head. Costs of amortization and facility in farrowing pens were determined with estimated useful life (25 years) and the projected number of porkers. Costs of amortization of basic bevy of pigs were calculated as the difference between the purchase and slaughter value assigned to the predicted number of porkers. Calculation of costs of salaries of workers implies

the use of two people without qualifications. Averaged losses of fattened pigs on individual sector amounted to 0.5%. The given data are in agreement with previous studies (Zekić et al., 2008, 2010).

Calculation of production costs fattened pigs' race Mangulitsa is shown in Table 6. As in the previous case the first category of costs makes the production price of pigs for fattening.

Table 6. Calculation of total cost per fattening Yorkshire race

No	Expenses	UM	Price (RSD/UM)	Quantity (kg)	Value (RSD)
1	Piglets for fattening	kg	369,71	25	9.242,66
2	Food for fattening	kg	36,00	577,8	20.800,80
3	Veterinary services				60,09
4	Water				70,00
5	Electricity				50,00
6	Amortisation of the equipment and basic bevy				1.264,97
7	Salaries				816,73
8	Fattening losses				60,45
9	Total expenses				32.365,70

Source: authors' calculations

Reported amounts of feed in the calculation were determined on the basis of norms nutrient consumption of these categories for a given race. The total amount of food to feed fattening pigs from 25 to 132 pounds of body weight was 577.8 kg. The next category of costs makes the calculation of costs of veterinary services. This category was calculated based on estimates of the costs to 0.2% of total actual cost of growing and eating of piglets in the fattening stage. This value is lower than the Yorkshire breed because it is a native species and it has a much higher resistance to adverse conditions and submit posture. The fourth category consists of the costs of supplying water to farms in the calculated amount of 70 dinars per head, while the estimated costs of electricity amounted to 50 dinars per head. Costs of amortization and facility in farrowing pens were determined with estimated useful life (25 years) and the projected number of porkers. Costs of amortization of basic bevy of pigs were calculated as the difference between the purchase and slaughter value assigned to the predicted number of porkers. Calculation of costs of salaries of workers implies the use of two people without qualifications. Averaged losses of fattened pigs on individual sector amounted to 0.2%.

Conclusion

The calculation of the production costs of the both races of fattening pigs was performed under conditions of intensive breeding farm system. In this way, the established cost of production is without the overhead costs per pound of live weight. In accordance with that cost of production for Yorkshire race is 120.88 d/kg or 1.26 €/kg and it is lower than the current purchase price in the market. On the other hand cost of production for Mangalitsa race

is significantly higher than the purchase price of pigs bred races and it is 245.19 d/kg or 2.13 €/kg. These results are in case of fattening pigs race Mangalitsa less favourable compared to the previously established cost of production of fattening pigs race Mangalitsa in extensive breeding conditions where costs were about 1.71 €/kg live weight. The race Mangalitsa has very low productivity, and consequently achieves higher per-unit cost. Due to the extremely slow growth and high feed conversion, breeding of Mangalitsa can be economical only in the extremely extensive housing conditions and free grazing. Without additional feeding they can reach about 80 kg per year, which may be increase with adequate additional feeding. In addition, these breed fatteners have a lower percentage of lean meat and less favourable yield.

On the other hand, given the quality of the meat obtained in this way it is suitable as a raw material for the manufacture of products that can be labelled a protected geographical indication. Accordingly, this kind of production is necessary to implement through the higher level of finalization and thus it is possible to achieve a positive economic effects. In addition, the advantages over conventional production of fattened pigs concerning the circumstances that during the year supply and demand of fattened pigs bred races subject to significant cyclical fluctuations. This results in a significant change in the price of fattened pig and makes this production very risky. Accordingly own production of a specific product is the rational solution through which avoids negative impacts of price fluctuations and creates continuity in the supply of raw materials with uniform and satisfactory quality.

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POREĐENJE EKONOMSKIH OBELEŽJA TOVA SVINJA MANGULICA I SVINJA RASE JORKŠIR

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Sažetak

Cilj rada je poređenje ekonomskih obeležja proizvodnje tovljenika rase mangulica i rase jorkšir. Posmatrane proizvodnje trebaju da pruže sirovinsku osnovu za izradu tradicionalnih fermentisanih kobasica, odnosno specifičnih proizvoda sa zaštićenim poreklom. U skladu sa tim izveden je obračun ukupnih troškova tova svinja rase mangulica i jorkšir do klanične mase od 132 kilograma u uslovima savremenog farmskog sistema držanja. Navedeni obračun uključuje troškove osnovnog i pomoćnog materijala, troškove energije i troškove eksternih usluga, troškove zarada i amortizacije korišćenih objekata i opreme. Na ovaj način moguće je doći do ukupne cene koštanja proizvedenih tovljenika po kilogramu žive mase bez opštih troškova. Cena koštanja obračunata na navedeni način za tovljenike rase jorkšir iznosi 120,88 d/kg odnosno 1,26 €/kg i niža je od trenutne otkupne cene na tržištu. Sa druge strane, cena koštanja za tovljenike rase mangulica znatno je viša od otkupne cene za tovljenike oplemenjenih rasa i iznosi 245,19 d/kg odnosno 2,13 €/kg što je uslovljeno sporim prirastom i neefikasnom konverzijom hrane u odnosu na oplemenjene rase.

Ključne reči: tov svinja, jorkšir, mangulica, troškovi

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