Economics of agriculture
SI – 2
UDK: 636.2:339.13 (497.115)

ECONOMIC EFFECTS OF CATTLE MEAT PRODUCTION OF DIFFERENT GENETIC PROVEINIENCE IN MOUNTAINOUS AREAS OF NORTHERN KOSOVO AND METOHIA

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Resume

In this research we examined the influence of two different genotypes (Simmental and crossbreed of Simmental and busa) on: weight gain(y), feed consumption for weight gain(x) per month during the fattening period average productivity (A.P.), represented by relation of total weight gain and consumed nutritive units, marginal weight gain (M.G.), which represents ratio of increased weight gain and increased input of nutritive units, as well as weight gain elasticity for achieved production level i.e. ratio of proportional weight gain increment and proportional increment of nutritive units during the fattening period. Fattening results show that cross-breed F1 achieved lower daily weight gain for 11,24% and higher feed consumption per growth unit (7,041 : 5,975) than Simmental cattle. Average productivity has a beneficial trend in Simmental cattle in comparison with cross-breed F1 generation. Coefficient of correlation among feed and weight gain during the fattening period in cross-breed was 0,733, while in Simmental breed it was 0,569.The achieved economic effects of fattening are a consequence of genetic predisposition of genotypes investigated, since fattening process evolved in identical conditions, so that non-genetic variance could be conditionally neglected.

***Key words**: Simmental breed, Busa, cross-breed, weight gain, economy.*

Introduction

Cattle meat represents remarkably important foodstuff for nutrition of citizens in Kosovo and Metohia, since of total amount produced on cattle meat comes 43%.

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However, although present on this territory in higher amount than other kind of meat, total amount of meat produced is small and insufficient to satisfy population demands (***Statistical office of Kosovo 2009, Đorović et al.*** **2010**).

Low cattle meat production is a consequence, before all, of a bad breed structure, in which, autochthonous busa breed participate with more than 40% (***Spasić et al..*** **2010)**.

Being that cattle Busa (because of small exterior dimensions and weight, late maturation and weak feed utilization) represents bad material for the production of large good quality meat amounts, producers tend to perform an alteration of the breed structure by crossing Busa cattle with high productive breeds.

The basic goal of this research was to compare the influence of different genetic potentials in identical conditions, on economic effects in the production of meat.

Material and methods

Investigation of economic effects of cattle fattening was performed in the area of Zubin Potok municipality. For the research 37 calves were purchased from the local market, wherefrom there were 20 Simmental heads and 19 Busa x Simmental crosses. During the purchase only animals suitable for fattening were selected. During the fattening period animals were kept in a tied stall housing system grouped by body weight. Daily diet was arranged according the average body weight and feeding was group performed with registration of feed consumed, which derived data regarding the total amount of feedstuffs consumption, that is to say, nutritive units per 1 kg of weight gain.

The first weighing of cattle was performed in the day 30, after the beginning, thereafter weighing was performed every 30 days and, finally, at the end of the fattening period, so that it was possible to follow the changes regarding the weight gain of cattle.

The data processing was performed by the implementation of adequate mathematical-statistical methods (***Stanković et al.*** **1990)**. The significance of coefficients of dependency r_{xy} was computed by using the t-test. The fattening period lasted 213 days.

Results

Genetic potential within the meat industry is very often limiting production factor, with respect to fattening economical effect.

Genetic abilities of food transformation into the weight gain per months of fattening period and examined genetic groups has been given in table 1.

Table 1. Average daily feed consumption and average daily weight gain

	x		*dx*	*y*		*dy*	*y/x* (PP)	*dy/dx* (MP)	E=(*dy/y*) / (*dx/x*)
Month	Nutritive units			Gain			Average productivity	Marginal productivity	Productivity elasticity
	kg	%		kg	%				
Simmental breed									
1	5.00	100.0	-	0.982	100.0	-	0.196	-	-
2	6.51	130.2	1.51	1.278	130.1	0.296	0.196	0.196	1.000
3	6.67	133.4	0.16	1.282	130.6	0.004	0.192	0.025	0.130
4	7.30	146.0	0.63	1.284	130.7	0.002	0.176	0.003	0.009
5	7.65	153.0	0.35	1.275	129.8	-0.009	0.167	-0.025	-0.155
6	9.03	180.6	1.38	1.291	131.5	0.016	0.143	0.011	0.078
7	9.20	184.0	0.17	1.210	123.2	-0.065	0.132	-0.382	-0.043
Crosses (simmental x busa)									
1	5.46	100.0	-	0.813	100.0	-	0.148	-	-
2	6.82	124.9	1.36	1.096	134.8	0.283	0.161	0.208	1.296
3	6.94	127.1	0.12	1.112	136.8	0.016	0.160	0.133	0.823
4	7.69	140.8	0.75	1.147	141.1	0.035	0.149	0.046	0.309
5	8.11	148.5	0.42	1.189	146.2	0.042	0.146	0.010	0.686
6	9.12	167.0	1.01	1.176	144.6	-0.013	0.129	-0.012	-0.100
7	9.58	175.4	0.46	1.099	135.2	-0.077	0.115	-0.167	-1.458

Besides average daily nutritive units consumption and realized average daily gain per months, the table contains absolute and relative values of two features, then marginal fattening effects, relation of nutritive units utilization and achieved weight gain, an at the end elasticity coefficient of physical production volume has been determined. On the basis of obtained data aiming at determination of food transformation into the weight gain dependency per breed, following basic parameters have been calculated:

Tendency of nutritive units consumption (x) and weight gain obtained (y) by months of the fattening period, subsequently average productivity (AP), marginal gain (MG) and weight gain elasticity for an obtained production.

An average productivity represents a ratio between total weight gain and nutritive units consumed. Marginal productivity represents relationship between an increased weight gain and an increased investment of nutritive units.

The elasticity represents a relationship of the proportional weight gain increment and proportional increment of nutritive units during the fattening period.

From the table it can be noted certain processes and tendencies that could not be characterized as breed features of investigated animals.

It is obvious that breed genetic potential has not been expressed, since animals differently undergone trough different fattening conditions and since they weren't uniform regarding the stature and body weight

Average productivity of 0,1673 has a more favorable tendency in Simmental animals versus crosses of Simmental and Busa whose coefficient averaged 0,142. Elasticity coefficient values in Simmental breed particularly has been expressed at second add-in point, while in crosses at second and third.

The animals of booth groups at add-in point 5 and 7, and 6 and 7 demonstrate a low degree of elasticity below zero, which is connected with a presence of another limiting element in the fattening process that restricted further feed investments and depicted an upper profitability limit of feed transformation into the weight gain.

It stands to sense that in booth investigated groups some similarities exist in appearance motions but not with the same intensity, where quality differences that cause a different economic results due to different nutrition units consumption and animal prices, could be neglected.

The consumption of nutritive units for the unit of weight gain by breed and fattening phases has been presented in table 2.

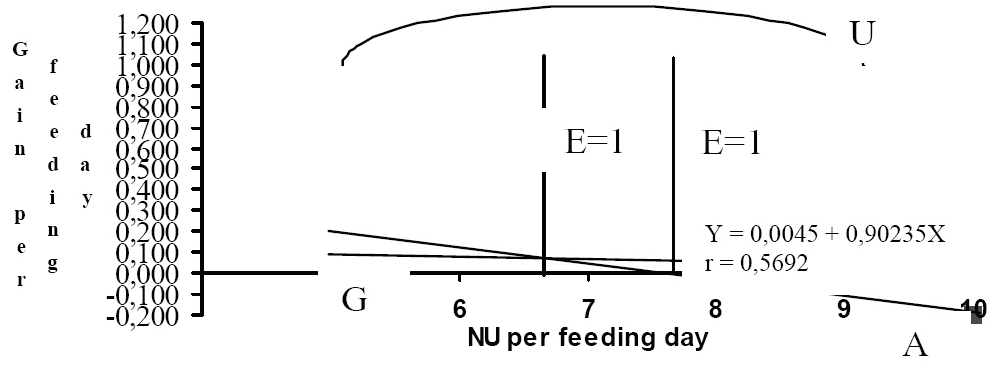
Table 2. Nutritive units consumption for kg of weight gain

Indicators	BREED	
	Simmental	Crosses (simmental x busa)
I phase	5,130	6,363
II phase	6,558	7,483
Average	5,975	7,041

During the fattening period cattle consumed average 6,473 nutritive units per 1kg of weight gain, but as it can be seen, there are significant differences regarding this feature Similar results quote ***Milutinović (*1977*), Jovanović et al. (*1992*) and Koljajić et al. (*1995*).***

In actual feeding and housing conditions at whom research has been conducted with Simmental cattle the top weight gain is achieving at fourth month as it can be seen from graph 1.

Graph1.Variation of total terminal and average daily weight gain of simmental cattle



At a point where marginal production reaches a zero, maximum weight gain has been accomplishing. Regarding to this a question arises how much feed is necessary to spend per one animal. An answer is located within the context of second stage function wherein:

$$E < 1 \quad i \quad E > 0$$

If necessary to achieve highest weight gain, feed consumption should be increased to 7,30 NU per feeding day, because this amount of feed accomplishes the highest gain of live mass, as it quotes ***Drobac (*2008)** in his theoretic considerations. In Simmental x Busa crosses feed consumption should be increased to 8,03 NU per feeding day, when the highest weight gain has been accomplishing (graph nr. 2)

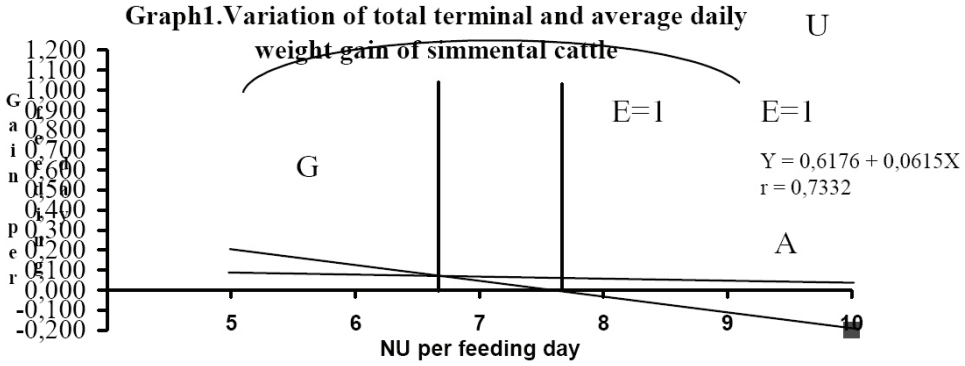


Table 3. Economical-financial results of cattle fattening (in €)

		Per 1 fatling Euros	
	INDICATORS	Simmental breed	Crosses F_1
I	***Expenses***	***503,4***	***483,8***
1	**Material**	**485,9**	**466,3**
a)	Basic	451,9	430,3
	fattening cattle	*210,6*	*181,1*
	feed and bedding	*241,3*	*249,2*
b)	Auxiliary	11,5	13,3
	Medicine	*8,6*	*10,4*
	Rest	*2,9*	*3,1*
c)	Services	22,5	22,5
	Tractors	*7,8*	*7,8*
	Trucks	*5,5*	*5,5*
	Interest	*9,1*	*9,1*
2	Amortization	9,4	9,4
3	Workers salaries	8,1	8,1
II	***Revenues***		
	(live mass – redemption price)	***696,9***	***583,2***
III	***Profit accomplished***	***193,4***	***98,6***
IV	***Taxes and contribution***	***17,3***	***8,9***
V	***Accumulation***	***176,1***	***90,5***
VI	***Cost price***		
	(1 kg live mass)	***1,1***	***1,2***
	Selling price	**1,55***	**1,47***

** Source: /www.stips.minpolj.gov.rs*

Total financial result in cattle fattening is positive. Positive differences are significantly advantageous in Simmental cattle and similar conclusions present ***Cvetković et al*. (2006)**.

From all above presented it could be concluded that during the fattening process genetic potential for feed utilization, was considerably pronounced in Simmental cattle, which determined cost-effectiveness of the breed.

Conclusion

During the fattening, cattle crosses achieved worse daily weight gain from cattle of Simmental breed for 11,24%, which indicate order of economic benefit from investigated genotypes in the production process-fattening.

The consumption of nutritive units per kg of weight gain is lower in cattle of Simmental breed in relation to crosses (7,041). The cost-effectiveness here has been accomplishing by savings of nutritive units in relation to crosses

An average productivity in Simmental cattle had an optimal tendency, similar to cattle crosses that had the same tendency.

Correlation coefficient between feed and weight gain during the whole fattening period in crosses of Simmental and Busa amounted 0,7332 and in Simmental cattle 0,5692.

An optimal point of feed consumption and weight gain realized in Simmental cattle is 6,51 NU and 1,278 kg of weight gain and in crosses 7,61 NU with 1,47 kg of weight gain.

The economic results accomplished during the fattening are a product of the genetic potentials and fattening conditions.

On the basis of above elaborated it can be concluded that genetic potential of investigated cattle in existing environment defines cost-effectiveness and that is necessary to consider selection of adequate breed of fattening cattle.

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