

STUDY CONCERNING THE ECONOMIC EFFICIENCY IN PIG FATTENING

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Abstract

The paper presents the analysis of economic efficiency in intensive fattening of pigs. The data were collected from two farms: F1- SC Gromfid SRL, Prahova County and F2 – SC Goliath SRL, Brăila County. The reference period of the technological parameters and economical and financial performances has been 2008-2010. Based on the data of the year 2010, the gross margin method was used for calculating the specific indicators of economic efficiency. Farm F1 achieved 2.8 series of fatty pigs weighing 100 kg at slaughter with 636 g daily gain/head. Per housing place, total production expenses counted for Lei 1,551.70 of which 94.13 % variable costs. Gross margin was Lei 611.30 and net profit Lei 437 per housing place under 28.16 % profit rate. Farm F2 carried out 2.6 series fatty pigs delivered at 110 kg, fewer than 850 g daily gain/head. The production cost was Lei 1,522.98/housing place, of which 84.18 % variable costs. Gross margin registered Lei 727.67 and net profit counted for Lei 408.93/housing place under a 26.85 % profit rate. Production cost counted for Lei 5.54 for F1 and Lei 5.32 for F2 per kilogram live weight. As a conclusion, the intensive pig fattening assures farm profitability based on a rational management of technological aspects and related production costs. Farm efficiency is deeply influenced by piglets' price, feedstuff quality and price, daily gain, weight and price of fatty pigs at delivery.

Key words: economic efficiency, intensive fattening, pigs

INTRODUCTION

Gross Margin is the barometer of economic efficiency in farms showing the grade in which production factors are able to produce profit [2]. It allows comparing the economic efficiency of various production directions in a farm, to compare farms, regions and countries among them [4, 5, 6, 10].

The economic efficiency in pig fattening is influenced by the purchasing price of piglets, feedstuff quality, consumption and price, daily gain, live weight at delivery and market price of pigs per kilogram live weight [7, 9].

For improving the technical, economical and environmental performances in pig farming, a series of methods such as DEA (Data Envelopment Analysis) based on linear programming were used [1, 3, 8].

In this context, this paper aimed to make a comparison concerning economic efficiency in

2 farms dealing with intensive pig fattening, but of a different production capacity. The idea emerged from the necessity to find efficient solutions for farms of various sizes existing in our country, without taking into consideration subsidies provided by Government.

MATERIAL AND METHODS

In order to set up this paper, the data registered by two farms dealing with pig fattening in the period 2008-2010 were used. The both farms were growing Large white and Landrace crossbreds, but production capacity of farms was different: F1-2,700 fatty pigs/year and F2- 7,000 fatty pigs/year.

From a technological point of view, the comparison between the 2 farms was based on the following parameters: number of series of fatty pigs/year, length of fattening, production cycle, and piglets' weight at the beginning of fattening, pigs live weight at deliver, total and daily gain, food consumption. Also, the economic performances were comparatively analyzed based on the following indicators: number of fatty pigs delivered per year, meat

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production as live weight, average sale price, sales coming from sold pigs and manure, unitary production cost, total production costs, and net profit per farm.

The calculation and comparative analysis of gross margin was done only for the year 2010. Gross Margin was determined using the formula: $GM=GP-VC$, where: GM = gross margin, GP=gross product and VC=variable costs. The calculation was made in the national currency (Lei) without taking into account subsidies. The exchange rate in 2010 was Euro 1=Lei 4.2.

Gross product included income coming from sold fatty pigs and manure evaluated at market prices. Variable costs included: biological material (number of piglets purchased at 30 kg for F1 and 25 kg for F2 at Euro 47/head or Euro 2/kg live weight, feedstuff consumption and its market price, medicines and veterinary services, electricity and other costs (fuel needed for manure collection and sheds heating, water and blood analysis, repairs per housing place, animal insurance). Fixed costs included: full time labour, general costs, depreciation, interest

related to borrowings, membership fee for Pig Breeders Association.

Finally, the comparative analysis of economic efficiency per fatty pig was done based on production cost, sale price, profit and profit rate. Also, the economic dimension of the 2 farms was determined based on the value of an economic size unit (1 ESU=Euro 2,000) established by the E.U.

RESULTS AND DISCUSSIONS

Farm F1 achieved 2.8 series of fatty pigs of 100 kg live-weight. Piglets live-weight varied between 25 and 30 kg being purchased at Euro 47/head or Euro 2/kg live-weight. During the fattening, daily gain was 636 g/head in average, assuring a 70-75 kg total gain under 2.74-2.92 foodstuff consumption/kg gain. Farm F2 raised 2.6 series of fatty pigs/year, delivered at 110 kg live-weight. During the 100 days of fattening, the pigs consumed 2.90 kg foodstuff/kg gain, under an 850 g daily gain/head and 85 kg total gain for the whole fattening period. The average food consumption during the last 3 years was almost similar to the one registered by F1 (Table 1).

Table 1 Technological Parameters in F1 and F2, 2008-2010

Specification	MU	2008		2009		2010	
		F ₁	F ₂	F ₁	F ₂	F ₁	F ₂
No series of fatty pigs/year	No. series	3	2.6	2.5	2.6	2.8	2.6
Length of fattening	days	112	100	114	100	110	100
Cleaning and disinfection etc	days	7	10	7	10	7	10
Production cycle	Days	119	110	121	110	117	110
Piglets live-weight at the beginning of fattening	Kg/head	25	25	26	25	30	25
Pigs live-weight at deliver	Kg/head	100	110	100	110	100	110
Total gain	Kg/head	75	85	74	85	70	85
Daily gain	g/head/day	669.64	850	611.57	850	636.36	850
Feedstuff consumption	Kg feedstuff/kg gain	2.74	2.80	2.89	2.90	2.92	2.90

Economical and Financial Performances.

Compared to F1, F2 delivered 25,040 fatty pigs by 3.45 times more than F1 during the period 2008-2010 taking into account farm size given by the number and capacity of pig sheds.

Pork production as live-weight carried by F2 counted for 2,754.4 thousand tons, by 3.8 times higher than 723.9 thousand tons achieved by F1. Its level was positively influenced by the

higher number of delivered fatty pigs and their higher live-weight at slaughter.

The average price at pig deliver during the analyzed period was Lei 6.13/kg for F1 and Lei 5.93/kg for F2, varying from a region to another according to offer/demand ratio.

Sales coming from sold fatty pigs counted for Lei thousand 4,449 for F1 and Lei thousand 16,493.2 for F2 by 3.7 times

more than in case of F1. This indicator was positively influenced by pig live-weight and sale price offered by processors.

Average production cost was Lei 5.15/kg live-weight for F1 and Lei 5.07/kg for F2. Therefore, the higher meat production in terms of live-weight, the higher production costs, but a little bit lower unitary production cost per kg live-weight. Total production expenses counted for Lei thousand 3,745.2 for F1 and Lei thousand 14,035.8 for F2.

They are higher for a higher meat production in terms of live-weight.

Gross profit, resulted as a difference between incomes and production costs, counted for Lei thousand 703.8 for F1 and Lei thousand 2,457.4 for F2. As a consequence, net profit, obtained after subtracting profit tax, varied between Lei thousand 591.1 in F1 and Lei thousand 2,064.1 in F2. (Table 2).

Table 2 Economical and Financial Performance of F1 and F2, 2008-2010

Specification	MU	2008		2009		2010	
		F ₁	F ₂	F ₁	F ₂	F ₁	F ₂
No. of delivered pigs	heads	2,660	6,280	1,932	9,300	2,647	9,460
Meat Production (live-weight)	Tons	266	690.8	193.2	1,023	264.7	1,040.6
Average sale price	Lei/kg live-weight	5.8	5.5	6.0	6.0	6.6	6.3
Sales from sold pigs	Lei thousand	1,542.8	3,799.4	1,159.2	6,138.0	1,747.0	6,555.8
Production cost	Lei/kg	4.95	4.90	4.98	5.00	5.54	5.32
Total production expenses	Lei thousand	1,316.7	3,384.9	962.1	5,115.0	1,466.4	5,535.9
Gross Profit	Lei thousand	226.1	414.5	197.1	1,023.0	280.6	1,019.9
Net profit	Lei thousand	189.9	348.1	165.4	859.3	235.8	856.7

The analysis of production cost per housing place pointed out that, in the year 2010, F2 registered Lei 1,522.98 production expenses by 2% lower than F1 (Lei 1,551.70).

Variable costs in pig fattening represented 94.13% in F1 and 84.18% in

F2 of total production costs. Their level was influenced especially by piglets and feedstuff purchase, whose share in total production expenses was 47.09% and, respectively 43.35% for F1 and 43.54% and, respectively 35% for F2.

Table 3 Analysis of Production Costs per housing place in F1 and F2 in the year 2010

Cost item	F1		F2	
	lei	%	lei	%
VARIABLE COSTS, of which:	1,460.70	94.13	1,282.13	84.18
-Biological material	730.80	47.09	532.98	35.00
- Feedstuff	672.75	43.35	663.07	43.54
-Medicines, veterinary services	10.96	0.70	22.68	1.49
- Electricity	5.18	0.33	15.98	1.05
-Other materials	38.54	2.48	45.26	2.97
-Supplying	0.07	0.03	0.19	0.01
-Insurance	2.40	0.15	1.97	0.12
FIXED COSTS, of which:	91.00	5.87	240.85	15.81
- Full time labour	74.00	4.76	86.15	5.65
- General costs	9.00	0.59	11.30	0.74
- Depreciation	8.00	0.52	46.00	3.02
-Interest to credits	-	-	92.00	6.04
-Membership fee to Pig Breeders Association	-	-	5.4	0.36
TOTAL PRODUCTION COSTS PER HOUSING PLACE	1,551.70	100.00	1,522.98	100.00

Taking into consideration 2% piglets' loss, the farmer owning F1 bought 2.9 piglets weighing 87 kg at Lei 8.4/kg live-weight.

Feedstuff cost per housing place counted for Lei 672.75 in case of F1 for purchasing 759 kg of which: 66.4 % maize (Lei 0.6/kg), 14.9 % imported soybean cake (Lei 1.4/kg), 12 % sunflower cake (Lei 0.65/kg) and 6.7 % zoofort (Lei 3/kg). In F2 the amount of feedstuff consumed per housing place (2.6 pigs) was 720.90 kg of which: maize 50 % (Lei 0.7/kg), barley 23 % (Lei 0.77/kg), imported soybean cake 15 % (Lei 1.55/kg), sunflower cake 9 % (Lei 0.78/kg) and zoofort 3 % (Lei 3/kg).

Other cost items such as: full time labour, veterinary services, electricity, fuel, water and depreciation should not be ignored (Table 3).

Gross Margin per housing place

In case of F1, GM was Lei 611.30 resulting from the difference between Lei 2,072 gross product and Lei 1,460.7 variable costs. In case of F2, GM was Lei 727.67 by 19 % higher than for F1, taking into account the reduced variable costs by 13 %.

Gross Profit was Lei 520.30/housing place in F1 and Lei 486.82 in F2, its level being directly influenced by gross margin and fixed costs. The obtained results are similar to the ones achieved by other researchers for a farm producing 2,800 fatty pigs and obtaining Lei thousand 506 gross margin [2, 10].

Net profit was lei 437.05 in F1 and Lei 408.93 in F2 per housing place. This was due

to the lower fixed costs in F1, because it is a middle sized farm registering lower costs with full time labour and depreciation. Net profit rate counted for 28.16 % in F1 and 26.85 % in F2, the difference between the profitability rates of the two farms being 1.31% (Table 4).

Table 4 Gross Margin per housing place -a Barometer of Economic Efficiency in F1 and F2 in the year 2010 (Lei/housing place)

Specification	F1	F2
Gross Product	2,072.00	2,009.80
Variable Costs	1,460.70	1,282.13
Gross Margin	611.30	727.67
Fixed Costs	91.00	240.85
Gross Profit	520.30	486.82
Total Production Costs	1,551.70	1,522.98
Profit Tax	83.25	77.89
Net Profit	437.05	408.93
Profit Rate (%)	33.53	31.96
Net profit rate(%)	28.16	26.85

Economic Efficiency per fatty pig

In the larger farm F2, production cost was higher, Lei 585.76/fatty pig by 5.7 % higher than in F1.

The sale price per fatty pig of 110 kg was Lei 693, by 5 % higher than in case of F1. As a consequence, F2 registered Lei 107.24 profit/pig by Lei 1.41 (1.33 %) higher than in F1 where profit counted for Lei 105.83. Profit rate was 18.30 % in F2 and 19.09 % in F1, the difference of 0.79 % was generated by the higher production expenses/fatty pig in F2 (Table 5).

Table 5 Economic Efficiency per Fatty Pig

Specification	MU	F1	F2
Live-weight of delivered pig	Kg/head	100	110
Production Cost	Lei/pig	554.17	585.76
Sale price per fatty pig	Lei/pig	660	693
Profit per fatty pig	Lei/pig	105.83	107.24
Profit rate per pig	%	19.09	18.30

Analyzing the situation at farm level, it was noticed that F2 achieved by 3.75 times grosser product, by 3.37 times higher variable costs and by 5.16 times a higher gross margin. Dividing gross margin recalculated in Euro by the value of an economic size unit (1 ESU =

Euro 2,000 for Romania in the year 2010 established by the E.U.), it was noticed that F1 registered 43.65 ESU, being classified into the middle sized farms and F2 recorded 225.67 ESU, corresponding to the 9th class including large sized farms (Table 6).

Table 6 Gross Margin at Farm Level land Economic Dimension of the farms in the year 2010

Specification	F1	F2	F2-F1
Gross Product (Lei)	1,747,000	6,555,800	+4,808,800
Variable Costs (lei)	1,380,322.3	4,660,120.6	+3,279,798.,
Gross Margin (lei)	366,677.7	1,895,679.4	+1,529,001.7
Euro 1= Lei 4.2	87,304,2	451,352.2	+364,048
Economic Farm Size Units, ESU	43.65	225.67	+182.02
Classification according to Decision 1999/725 EC	VIII - Middle-sized farm	IX-Large sized farm	-

CONCLUSIONS

Pig fattening in larger farms assures a higher economic efficiency because meat production in terms of live-weight and sales is higher and production costs, even though they are increased, determine a reduced cost per kg live-weight and a higher profit.

Per housing place, costs are lower in larger-sized farms. Biological material and feedstuff cost keep the highest share in production costs with a deep impact on economic efficiency of pig fattening.

Gross margin per housing place is higher in larger farms because variable costs register a lower increasing rhythm compared to gross product.

As a conclusion, intensive pig fattening is profitable under the condition of Romania, without taking into consideration Government subsidies. It is recommended to be used both by large farms belonging to commercial companies and middle-sized farms specific to family association. Intensive pig fattening is more efficient in larger farms because production cost per fattened pig is lower and profit is higher.

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