Interaction of selected production indicators of the economics of pork production

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ABSTRACT: Estimates of the effects influencing the economics of pig production are of primary importance for breeders. For this purpose, costs, revenues and profitability were determined on the basis of individual parameters of the efficiency of tested pigs and of average commodity prices. The calculation was the result of the efficiency of actual animals and of the average and simulated prices of inputs received by producers in large-scale production operations. 136 animals, 64 of crossbred combinations (LWs × D) × (LW_D × L) and 72 of PN × (LW_D × L) were used. The total cost of 1 pig represented the costs per weaned piglet, feed and other costs; the revenues represented the actual price of a pig at slaughter. Multivariable hierarchical models were constructed to assess the relationships between the following factors: crossbred combination, nutrition and sex, ADG, number of piglets bred, CFM price and carcass price with the outcome variables: costs, revenues and profitability. The results demonstrated that the total cost of fattening pig is considerably influenced by the price of a piglet and feed, not by the price of the carcass and the growth intensity. There was no proof of a relationship between the price of a pig and reproduction and/or the price of feed. Profitability is significantly influenced by the reproduction rate, price of feed, growth intensity and revenues. The results also showed that the intensity of nutrition and the sex considerably influence the total cost of 1 fattened pig, which represents an increase in the total cost by 3.80 € in the application of *ad libitum* feeding techniques, and 5.39 €/pc in the fattening of barrows. The choice of a suitable combination represents a decrease in the total cost by 1.49% and an increase in revenues by 2.93%. Profitability is significantly associated with the intensity of nutrition, sex and breed. With unrestricted feeding it is reduced by 4.1%, for barrows by 6.6%, and in the use of four-breed combinations of crossbreds it increases by 4.13%.

Keywords: pig; fattening; pig potential; economics; cista; revenue; profitability; relationships

The economic efficiency of pig breeding results from detailed analyses of displays and influences of individual production factors on the final effect (Poděbradský and Martinek, 1986). It is an efficient tool for the management of production herds which presupposes the knowledge of objective data on the potential of the animals bred. This data is acquired by continuous verification of subpopulations of livestock, including pigs (Edwards et al., 1989; Rao and McCracken, 1990). The knowledge of the progress of individual pig potential traits in various pork production stages can be used for the construction of economic and genetic models (Jakubec, 1993; Sölkner, 1993). They can help simulate the estimates of various effects which influence the animal potential and/or breeding economics (Frey et al., 1997).

One of the most important and principal steps of a pig breeder and producer is the selection of geno-

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types for production herds (Šprysl et al., 2009). In healthy breeds, they represent a substantial part of the existing variability among producers in production profitability (Jensen et al., 2007). A change in hybridization influences the production efficiency, which is expressed in the function of production potential by growth intensity, feed conversion and lean meat share while a decrease in the growth intensity prolongs the fattening period and decreases the turnover ratio (Poděbradský, 1998). An increase in the feed conversion ratio results in an increase in expenses on feed, which decreases the difference between total income and variable costs (Stamer et al., 2009). Determination of the effect of genotype or other effects (sex, lines, feeding strategy, etc.) on the profitability of production can be exactly simulated from the results of individual animals bred in defined environmental conditions (Nagy et al., 2004; Jensen et al., 2008).

This paper deals with the quantification of the influence of genotype, nutrition, sex, growth intensity, extent of reproduction, prices of feed and carcass on the effectiveness of pig breeding, which is determined by costs, profits, and profitability. At the same time the interdependence of the monitored factors on the economics of production, which enable these factors to be changed, is shown.

Table 1. The contents of nutrients in CFM in *ad libitum* feeding

LW	DFI	LYZ	ME	LYZ:MEp
22.3	0.4	12.2	13.2	0.924
24.7	0.8	12.2	13.2	0.924
29.4	0.9	12.2	13.2	0.924
34.9	1.3	12.2	13.2	0.924
40.3	1.5	12.2	13.2	0.924
46.8	1.9	12.2	13.2	0.924
53.6	2.2	12.2	13.2	0.924
61.0	2.5	12.2	13.2	0.924
68.0	2.7	12.2	13.2	0.924
75.6	2.9	12.2	13.2	0.924
82.1	3.1	12.2	13.2	0.924
87.7	2.9	12.2	13.2	0.924
93.9	3.0	12.2	13.2	0.924
99.3	2.9	12.2	13.2	0.924
105.6	2.9	12.2	13.2	0.924
106.6	3.0	12.2	13.2	0.924
112.4	3.0	12.2	13.2	0.924

MATERIAL AND METHODS

Animals, feed

Data were acquired from two station tests of animals, representing two groups of crossbred pigs, the total number of animals being 144. Crossbred combinations, in the dam position (A, B) of which LW_D × L crossbreds were used, and in the sire position (C) crossbred boars LW_S × PN in the first group with 72 animals of purebred boars of the PN breeds, and in the second group, pairs 72 nimals.

Pigs of balanced sex ratio (gilt/barrow) in the test were penned in pairs (of the same sex) with the average live weight of 25.0 ± 2 kg, thus at the age of 60–80 days from birth. Their selection was performed in two production herds so that the tested subpopulation would represent the complete structure of dam and sire lines used in the monitored breeds, which covered genetic variability of the tested pig populations. This means that the weaned piglets came from mothers with the widest spectrum of sire C-position, whereas the re-insemination of sows observed the principle of applying insemination doses of the same breed.

Standardization of the station environment from the aspect of temperature, humidity and NH_3 concentration was ensured by the technology of a fully-controlled microclimate.

Upon penning, the weaned piglets in each test were divided into two groups with regard to feeding strategy. The first subgroup was fed complete feed mixtures *ad libitum* in three stages and the continuous transfer from one stage to the next presented in Table 1.

The second subgroup received a reduced feed ration with regard to weight, in accordance with Table 2.

Complete feed mixtures (CFM) for all groups were mixed for each pen separately in accordance with the defined feeding curves. Three-component CFM (wheat, barley, soya) were administered and they were supplemented with feed premix.

Table 2. Contents of nutrients in CFM in restricted feeding

LW	DFI	LYZ	ME	LYZ:MEp
22.1	0.3	11.77	13.49	0.872
24.4	0.6	11.77	13.49	0.872
28.7	0.8	11.77	13.49	0.872
33.8	1.2	11.36	13.42	0.846
38.3	1.3	10.94	13.35	0.819
43.5	1.5	10.53	13.28	0.792
48.4	1.5	10.08	13.21	0.763
54.2	1.9	9.46	13.11	0.722
59.8	2.2	8.87	13.01	0.682
66.0	2.3	8.32	12.92	0.644
72.0	2.3	8.32	12.92	0.644
77.8	2.5	8.32	12.92	0.644
83.9	2.6	8.32	12.92	0.644
90.2	2.6	8.32	12.92	0.644
95.5	2.6	8.32	12.92	0.644
99.8	2.6	8.32	12.92	0.644
105.3	2.7	8.32	12.92	0.644

Data collection

The fattening parameters of each pig were monitored at weekly intervals during the entire period:

– average live weight in kg (LW);
– daily feed consumption – consumption of CFM in kg per day (DFI) for a pair (one pen) and then calculated per individual animal.

These data were used for the calculation of the following parameters:

– average daily gain in g (ADG);
– feed conversion ratio (FCR) – consumption of CFM in kg per 1 kg of live weight gain.

The parameters characterising the carcass value during the test were body meatiness, i.e. percentage of lean meat, monitored at weekly intervals from 60 kg of live weight of pigs to the end of the test.

Meatiness development, and/or lean meat formation, was monitored with an ALOKA SSD 500 sonographic instrument by regular measuring of the height of *MLLT* (*m. longissimus lumborum and thoracis*) and fat including skin up to the average weight of pigs 115 kg. The values were measured at 70 mm paramedially from the spinal canal (in mm) in two scans (A, B) using the SONOMARK SM-100 instrument.

Therefore, the lean meat percentage (LMP) of individual pigs during their growth was obtained at weekly intervals, whereas the LMP calculation used the SONOMARK SM-100 formula in the following form:

$$LMP = 63.87 - 0.447 \times fat - 0.51 \times fat\,2 + 0.128 \times muscle\,2$$

where:

fat 1–2 = backfat in scan A–B

muscle 2 = height of *MLLT* in scan B (Pulkrábek et al., 1994)

Model, calculation methods

The economic parameters which were used for the calculation of costs, revenues and profitability were the result of the parameters of the production potential of tested pigs and of average commodity prices in the Czech Republic in 2007 (Novák et al., 2008).

For each animal, the total cost, revenue and profitability were individually calculated. The calculation was the result of the production potential of an actual animal and of average and simulated prices for costs incurred by producers in large-scale pig operations in the Czech Republic (Novák et al., 2008).

The total cost per fattened pig (TC) included the costs per weaned piglet up to 25 kg (CPI), feed (CFE) and other costs (COT). Revenues per pig (RE) represented the selling price for one pig at slaughter (Novák et al., 2008).

The calculation of other costs, representing the total cost without feed, was the result of the average costs incurred by producers in the Czech Republic (Novák et al., 2008), which are determined for 100 feeding days (FD) in CZK, and of the production potential of an actual animal. For wider comparability, costs in Euros/100 FD were used for the calculation shown in Table 3.

Costs per 100 FD amounted to 21.99 €, and/or to 80.266 € per year. The calculation of other costs took into consideration different growth intensity of individual animals. The following formula was used in the calculation:

Table 3. Selected costs of the feed in €/100 FD

Medication	0.970
Other direct material	0.467
Other direct expenses and services	4.060
Total Wages	7.222
Writes-off	2.192
Auxiliary activities	1.473
Production costs	2.192
Administrative costs	3.414
Total expenses excluding feed	21.991

$$COT = (108 - 25) \times (80.2659/(ADG \times 365/1\,000))$$

where:
COT = other costs in the feed per 1 pig
108–25 = total gain in the test (kg), and/or slaughter – initial weight
80.2659 = other costs per year
ADG = average daily gain in g from 25 to 108 kg

The calculation of the cost of feed (CFE) was the result of the consumption of a complete feed mixture (CFM) in the total feed (25–108 kg) and of the price of the feed. The price of the feed was simulated on two levels in accordance with prices of 2007 and on the level of 233.561, and/or 161.696 €, per 1 000 kg. The structure of the data file is presented in Table 4.

The following formula was used in the calculation of the costs of feed:

$$CFE = priceCFM \times confedfat$$

where:
CFE = costs of the feed in the fattening period/1 pig
priceCFM = price of CFM in €/kg
confedfat = consumption of feed (kg) in the fattening period between 25 and 108 kg

The calculation of costs per weaned piglet (CPI) was the result of the average costs incurred by producers in the Czech Republic and the simulation of reproduction productivity. Reproduction productivity was simulated on three levels of calculation of weaned piglets per sow and year, thus 20, 25 and 30. The structure of the data file is presented in Table 4.

Table 4. Structure of the data file showing the simulation of reproduction productivity, carcass revenue and CFM price (€)

Data set	Weaned piglets/ sow/year (PIY)	Carcass revenue	FCM price
a	20	1.652893	0.233561
b	25	1.652893	0.233561
c	30	1.652893	0.233561
d	20	1.293568	0.233561
e	25	1.293568	0.233561
f	30	1.293568	0.233561
g	20	1.077973	0.233561
h	25	1.077973	0.233561
i	30	1.077973	0.233561
j	20	1.652893	0.161696
k	25	1.652893	0.161696
l	30	1.652893	0.161696
m	20	1.293568	0.161696
n	25	1.293568	0.161696
o	30	1.293568	0.161696
p	20	1.077973	0.161696
q	25	1.077973	0.161696
r	30	1.077973	0.161696

The following formula was used for calculation of the costs per weaned piglet:

$$CPI = 2.0481 \times 21/PIY \times weight\ 00$$

where:
CPI = cost per weaner in €
2.0481 = average cost per weaner in the Czech Republic
21 = average number of weaned piglets/sow/year in the Czech Republic
PIY = real number of weaned piglets of an actual individual
weight 00 = initial weight of pigs in the test

Revenues (RE), according to Wolfová et al. (2004) the most important economic factor influencing profitability, represent the actual realization price for one slaughtered pig. This is dependent on the carcass weight and realization price of 1 kg of carcass. The price per 1 kg of carcass results from the

declared price, carcass lean meat percentage and carcass weight. The basic price per 1 kg of carcass was simulated by prices in 2007 on three levels corresponding to the levels of 1.652893, 1.293568 and 1.077973 €. The structure of the data file is presented in Table 4.

Revenues were calculated individually for each animal by the LMP and carcass weight.

The following formula was used for the calculation:

RE = carcass price × price 1/100 × price 2/100 × carcaw

where:

RE = revenues per animal
carcass price = simulated declared price
price 1 = proportional correction of price in accordance with the LMP (Table 5)
price 2 = proportional correction of price by carcass weight (Table 6)
carcaw = carcass weight

Table 5. Price index depending on the LMP in the carcass

LMP (%)	Price 1
60.0 and more	103
59.0–59.9	104
58.0–58.9	104
57.0–57.9	102.5
56.1–56.9	101
56.0	100
55.0–55.9	99
54.0–54.9	97.5
53.0–53.9	96
52.0–52.9	94.5
51.0–51.9	93
50.0–50.9	91.5
49.0–49.9	90
48.0–48.9	88.5
47.0–47.9	87
46.0–46.9	85.5
45.0–45.9	84

Profitability (PR) was calculated for each animal individually as a proportional ratio of costs without revenues of the total cost. The following formula was used for the calculation:

PR = ((RE – TC)/TC) × 100

where:

PR = profitability in %
RE = revenues per animal in €
TC = total cost per animal in €

Data control

Seven animals were discarded from the tests due to death or low growth intensity. One animal was discarded at slaughter for failing to reach the carcass weight of 70 kg at slaughter. The total number of discarded animals was eight. Frequency distributions of the categorical variables: hybrid combination, nutrition and sex were used to identify potentially invalid results. The continuous variables such as ADG, DFI, number of piglets, LMP, and carcass weight were checked for extreme values.

Statistical analysis

We constructed a multivariable hierarchical model to assess the relationship between the following factors: hybrid combination, nutrition and sex, ADG, number of piglets bred, CFM price and carcass price, with the outcome variable: costs, revenues, profitability. The statistical software SAS version 9.1 (Proc Genmod) was used (Statistical

Table 6. Price index depending on the carcass weight

Carcass weight (kg)	Price 2
110 and more	85
105–109.9	95
100–104.9	97.5
82–99.9	100
75–81.9	97.5
70–74.9	95
60–69.9	85

Analysis System Institute, 2002) for the analysis. The initial model included all potential factors. To reduce the fixed effects, a reverse elimination strategy, using a significance level of 5% to exclude factors, was applied. The initial model was:

$$Y = \mu + A_i + R_j + C_k + J_l + B_m + F_n + S_o + AF_{in} + e$$

where:

Y = measured values of costs, revenues and profitability
μ = overall average
A_i = average daily gain
R_j = reproduction
C_k = feed cost
J_l = selling price of carcass per kg
B_m = breed
F_n = nutrition intensity
S_o = sex
AF_{in} = interaction between the ith average daily gain and the nth nutrition intensity

Verifications: the model was evaluated visually by QQ-graphs of residuals and graphs of residuals versus predicted values. The data in the tables are presented as the mean, standard deviation (SD), main effect least-squares means (LSM) with their standard errors (SEM) and significance levels.

RESULTS AND DISCUSSION

Description of file

The total number of pigs used in the experiment was 144 with the average weight of 25 ± 0.2 kg (SD = 3.28). Due to the health status, 8 animals had to be discarded (5.5%). A description of the individual monitored variables, including the calculation of costs, revenues and profitability, is shown in Table 7.

This table clearly shows that the difference in profitability between barrows and gilts in fattening, regardless of the genotype and nutrition, reached an absolute value of 9.31%, whereas barrows even demonstrated a negative value of –0.93%. As regards the other effects of genotype and/or nutrition, the differences in profitability reached the absolute value of 10.0 and 9.45%, respectively, whereas negative values were shown in the case of a three-breed genotype (–3.78%) and restricted feeding (–5.80%).

Correlation coefficients of monitored traits

Correlation coefficients of the monitored traits influencing economic efficiency (piglets, CFM prices, carcass revenue, weight gain), and produc-

Table 7. Descriptive statistics of the factors and variables included in the calculation of the profit margin (PM) (€)

Variable	*n*	TC[a]		RE[b]		PR[c]	
		mean	SD	mean	SD	mean	SD
Total	136	93.73	5.43	94.78	10.66	1.55	12.85
Sex							
Barrows	72	94.87	5.20	93.59	11.44	–0.93	13.47
Gilts	64	90.56	4.85	98.06	7.32	8.38	7.68
Genotype							
$(LW_S \times PN) \times (LW_D \times L)$	72	92.73	5.25	98.36	6.73	6.22	7.08
$PN \times (LW_D \times L)$	64	94.85	5.46	90.69	12.72	–3.78	15.66
Nutrition							
Ad libitum	71	93.82	5.56	96.92	8.74	3.65	10.93
Restricted	65	93.41	5.07	87.29	13.29	–5.80	16.19

[a]TC = cost of feed + price per weaned piglet + fixed costs (€)
[b]RE = carcass weight × price per kg carcass weight (€)
[c]PR = ((RE – TC)/TC) × 100

Table 8. Pearson's correlation coefficients (r) between the economic effectiveness of traits and pig produc-tivity

Trait	*n*	*r*	Statistical significance
TC			
PIY	2 312	–0.60294	< 0.0001
Price CFM	2 312	0.64922	< 0.0001
Carcass price	2 312	0.00172	0.9342
ADG	2 312	0.03809	0.0671
RE			
Carcass price	2 430	0.84085	< 0.0001
ADG	2 430	0.41525	< 0.0001
PR			
PIY	2 295	0.27802	< 0.0001
Price CFM	2 295	–0.33049	< 0.0001
Carcass price	2 295	0.74049	< 0.0001
ADG	2 295	0.32903	< 0.0001

TC – total cost; RE – revenue; PR – profitability; PIY – real number of piglets bred by an actual individual; ADG – average daily gain

tion potential reached was given by correlations are presented in Table 8. The higher the correlation and/or the closeness of the relationship, the higher the importance of including the monitored trait in the multivariable hierarchical model.

As apparent from the table, the total cost per fattened animal is markedly ($P \leq 0.0001$) influenced by the price of a piglet and feed ($r = -0.603 - 0.649$), not by the carcass price and growth intensity. The table also demonstrates that there is no relationship between the pig price at slaughter and the reproduction level, or feed price. This is significantly ($P \leq 0.0001$) influenced by the carcass price ($r = 0.84$) and growth intensity ($r = 0.42$), as reported by Wolfová et al. (2004). Profitability is significantly ($P \leq 0.0001$) influenced by the reproduction rate ($r = 0.28$), feed price ($r = -0.33$), carcass price ($r = 0.74$) and growth intensity ($r = 0.33$), which was confirmed by Jensen et al. (2007, 2008).

Statistical analysis

The results of multiple statistical analyses are shown in Tables 9–11.

The multiple factorial analysis (Table 9) documents the influence of the level of reproduction

Table 9. Estimates of the effects of the model describing the total cost (€)

Variable	Estimate	SE	*P*-value
Intercept	121.2078	0.090	< 0.0001
ADG	–0.0183	0.000	0.1355
PIY	–1.8111	0.001	< 0.0001
Price CFM	129.8154	0.430	0.0035
Breed			
$(LW_S \times PN) \times (LW_D \times L)$	–1.3954	0.006	0.0255
$PN \times (LW_D \times L)$	0		
Feed			
Ad libitum	3.8017	0.006	< 0.0001
Restricted	0		
Sex			
Barrows	5.3959	0.006	< 0.0001
Gilts	0		
Total gain × CFM price	0.1063	0.001	0.074

productivity and feed price on the total costs. Growth intensity together with feed costs influences the total cost. To reduce the total cost, it is necessary to select different feeding strategies in periods with a low cost of feed and in periods with a high cost of feed. The analysis showed the reduction of total costs with increasing reproduction productivity. Each weaned piglet means a reduction of 1.8111 € in the total cost, which represents a relative decrease by 1.9%. The total costs increase with the increasing cost of FCM. With an increase in the price of feed by 0.05 € per 1 kg, the total cost will increase by 6.49 €, which represents a relative increase by 6.9%.

Fixed effects, nutrition intensity and sex significantly influence the overall expenses per fattened pig at the 1% significance level. The same dependence and significance of effects were demonstrated by Jensen et al. (2008). The estimation using the least squares showed that the fattening of barrows and *ad libitum* feeding increased the total cost by 5.3959 and 3.8017 €, respectively, which was a relative increase by 5.8 and 4.1%.

This finding is related to the higher daily feed intake of barrows in comparison with gilts and higher consumption of feed *ad libitum*. This result is reflected in the better ability of gilts to deposit more lean meat compared to castrates that produce fattier carcasses. This is due to genetic aspects and castration of males resulting in different metabolisms of both sexes (Bahelka et al., 2007; Lazur et al., 2007).

The relationship of the total cost to the breed was demonstrated at the 5% significance level. The use of four-breed combinations in comparison with three-breed combinations represents a decrease by 1.3954 €, i.e. by 1.51%. The economics of fattening of multi-breed crossbred pigs was studied by Šprysl et al. (2000, 2004).

This analysis did not document any significant interactions between the total gain and the feed price.

Regarding the RE (Table 10), the analysis showed a relationship between growth intensity, carcass price and respective genotypes at the 1% significance level as documented in Table 9. Higher growth intensity increases the price per pig. An increase in gain by 10 g/day leads to an increase in revenues by 0.908 €, which represents a relative increase by 1%. Higher growth intensity also increases the slaughter weight and decreases the LMP (Pulkrábek et al., 2006; Stupka et al., 2008). This factor results in a decrease in the unit price per kg and thus in a decrease in total revenues. The price for a slaughter animal is the result of carcass weight and price per 1 kg of carcass. The price for 1 kg of carcass is proportionate to the LMP of the body carcass. An increase in carcass prices per 1 kg by 0.1 € is accompanied by an increase in revenues by 8.79 €, which represents a relative increase by 9.3%.

The use of four-breed in comparison with three-breed hybrid combinations results in an increase in revenues from fattening by 2.9%, thus by 2.7747 €. The

Table 10. Estimates of the effects of the model describing revenues (€)

Variable	Estimate	SE	*P*-value
Intercept	–77.9211	0.0194	<.0001
ADG	0.0908	0.000	<.0001
PIY	87.9265	0.0078	<.0001
Breed			
$(LW_S \times PN) \times (LW_D \times L)$	2.7747	0.006	<.0001
$PN \times (LW_D \times L)$	0		
Feed			
Ad libitum	–0.7957	0.006	0.1897
Restricted	0		
Sex			
Barrows	–1.1576	0.001	0.0496
Gilts	0		

Table 11. Estimates of the effects of the model describing profitability (€)

Variable	Estimate	SE	*P*-value
Intercept	–205.737	0.2999	< 0.0001
ADG	0.1307	0.0003	< 0.0001
PIY	1.7636	0.0014	< 0.0001
Price CFM	1.6552	1.561	0.0008
Carcass price	80.8584	0.0324	< 0.0001
Breed			
$(LW_S \times PN) \times (LW_D \times L)$	3.3913	0.0152	0.0032
$PN \times (LW_D \times L)$	0		
Feed			
Ad libitum	–4.1377	0.0186	< 0.0001
Restricted	0		
Sex			
Barrows	–6.6097	0.0136	< 0.0001
Gilts	0		
Total gain × CFM price	–0.2618	0.0017	0.0534

influence of sex was also demonstrated ($P \leq 0.0496$) when in the case of fattening of barrows revenues decrease by 1.2%, which represents 1.1576 €. This dependence corresponds to the finding of Šprysl et al. (2000, 2004). The analysis showed no correlation between revenues and nutrition technique.

Within the PR (Table 11), the multiple factorial analysis demonstrated significant correlations between the fixed effects of ADG, number of weaned pigs, CFM price, carcass price, nutrition intensity and sex ($P \leq 0.0001$), as well as with the breed ($P \leq 0.0032$). This means that by increasing the ADG by 10 g/day, profitability will increase by 1.307%. Each weaned pig contributes to the increase in profitability by 1.7636%. An increase in the carcass price per 1 kg by 0.1 € leads to an increase profitability by 8.0%.

In the case of *ad libitum* feeding and in the fattening of barrows, profitability decreases by 4.1377 and 6.6097%, respectively, i.e. by 3.90 and 0.39%, which is related to the correlations already demonstrated in Table 8. In the case of a four-breed genotype, the productivity of pigs can be increased by 3.3913%.

CONCLUSION

The economic analysis of production indexes shows that the total costs of the fattened animal are considerably influenced by the number of bred piglets, feed price, not by the price of dressed carcass and growth intensity. The existence of a relation between the price for a pig and reproduction was not proved – price for the feed. The revenues per 1 animal are significantly influenced by the price of 1 kg of dressed carcass and growth intensity. The profitability is then considerably influenced by ADG, higher reproduction, feed price and price of 1 kg of dressed carcass.

It was further proved that the feeding intensity significantly influences the total costs per 1 fattened pig. For the producers of pigs in the fattening of barrows it represents an increase in total costs by EUR 5.39, applying the ad libitum feeding technique an increase by EUR 3.80 per animal.

The importance of the selection of breed combination was also proved, where the fattening of four-breed combinations against three-breed combinations represents a decrease in total costs by 1.5% and an increase in revenues by EUR 1.3954 per animal.

As regards the efficiency, significant associations were proved with the intensity of nutrition, sex and breed. Ad libitum feeding and fattening of barrows decrease the efficiency by 4.1%–6.6%. The use of four-breed genotypes can increase the efficiency of fattened pigs by 3.4%.

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