

# The comparison of the cost-rate and profitability of the agricultural products in the SR and CR

## *Komparácia nákladovosti a rentability poľnohospodárskych výrobkov SR a ČR*

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**Abstract:** The article deals with the comparison and evaluation of the development of economic indicators, such as the costs, yields, economic result and profitability in the Czech and Slovak Republics for the period of years 1997–2000. The economic indicators are evaluated and compared on the basis of sample survey results of the RIAFE Bratislava and RIAE (Research Institute of Agricultural Economics) Prague. The first part contains the evaluation and comparison of the costs, yields and the economic results for agricultural production and its branches recalculated per 1 ha of agricultural land (a. l.). The second part contains the evaluation and comparison of the production intensity indicators (per hectare yields, utility), costs per 1 ha, 100 feeding days and per unit, and agricultural production realization prices. Based on these indicators, cost profitability of the selected plant and animal products is quantified.

**Key words:** comparison, costs, yields, economic result, profit, profitability

**Abstrakt:** Príspevok sa zaoberá komparáciou a hodnotením vývoja ekonomických ukazovateľov, ako sú náklady, výnosy, hospodársky výsledok, rentabilita v SR a ČR za obdobie rokov 1997–2000. Ekonomické ukazovatele hodnotí a komparuje na základe výsledkov výberových šetrení VÚEPP Bratislava a VÚZE Praha. V prvej časti sa hodnotia a komparujú náklady, výnosy a hospodársky výsledok za poľnohospodársku výrobu a jej odvetvia, v prepočte na 1 ha poľnohospodárskej pôdy, v druhej časti ukazovatele intenzity výroby (ha úrody, úžitkovosti), náklady na ha, 100 krmných dní a jednotku, realizačné ceny poľnohospodárskej produkcie a na ich základe sa kvantifikuje nákladová rentabilita vybraných rastlinných a živočíšnych výrobkov.

**Kľúčové slová:** komparácia, náklady, výnosy, hospodársky výsledok, zisk, rentabilita

In relation with the prepared entry of the Slovak and Czech agriculture into the European structures, the experts in the agrarian sector have been dealing with the issues of its competitiveness. The latter is assessed from various aspects, including, for instance, the agricultural and food production prices. We share the opinion that in general, the competitiveness of agricultural subjects closely relates to the economics of their product branches which entirely depends on the production costs and realized production prices as well as on other agrarian policy tools.

The agricultural product cost-rate is, both in the CR and SR, the subject of a long-term survey reported in the works of research institutions (Kubanková et al. 1997, 1998, 1999, 2000; Novák et al. 1997–2000).

Different international comparisons of the production and economic indicators have shown that it is difficult to compare the agricultural production cost-rate (Poláčková et al 1996). The reason lies in different methodical approaches, resp. cost calculation methods. While in the market economy countries the calculation preferred uses the method of incomplete costs divided into variable and

fixed costs, both in the SR and CR, the calculation applied was and is based on the complete costs divided into direct and indirect (overhead) costs.

Following the above mentioned facts, the objective of this article is to compare and to evaluate the development of the cost-rate and profitability of the agricultural production branches and of the selected agricultural products in the SR and CR for the period of years 1997–2000.

## MATERIAL AND METHODS

We compared the costs of the selected SR and CR agricultural products on the basis of data compiled by sample surveys in the SR and CR, focused on the cost-rate of agricultural products of legal entities.

These data are fully comparable because their construction has followed comparable methods of cost calculation, the compilation of which is of a long-term tradition in the SR and CR based on identical methodological approaches.

The comparison of product calculations allows to classify and to compare data on the costs and yields for the major branches, i.e. plant and animal production, resp. agricultural production.

In the article, we compare:

- intensity of the animal and plant production,
- costs of the plant, animal and agricultural production recalculated per 1 ha a.l. and per 1 SKK,
- yields of the plant, animal and agricultural production recalculated per 1 ha a.l. and per 1 SKK,
- production costs per 1 ha, resp. 100 feeding days (FD) and per unit, i.e. 1 ton (t), liter (l), kilogram of live weight (kg l.w.) recalculated to SKK.

The product costs are qualified as complete, what means that they contain both direct and indirect (overhead) costs.

- realized production prices.

At the evaluation of the cost-rate development, we apply the index and comparison methods. The data on costs and prices expressed in CZK and SKK are recalculated to the values in SKK at the following exchange rates:

Year	Rate
1997	1.065
1998	1.097
1999	1.196
2000	1.197

We express the economic result on the basis of data on costs and yields recalculated per 1 ha a.l. and qualify it as the difference between the costs and yields. Regarding the production branches, we qualify the profit indicator as the difference of the own costs per unit and realized production price.

We quantify the profitability indicator in % as the quotient of:

$$R = \frac{\text{Profit per unit}}{\text{Proper costs per unit}} \times 100$$

We compare and evaluate the data for the period of years 1997–2000.

## RESULTS AND DISCUSSION

The most important factors influencing the agricultural production cost-rate from the viewpoint of producers are prices of inputs and of production factors. Besides this, production profitability is influenced by the agricultural producers prices (product prices), re-distribution mechanisms (subsidies and taxes) as well as internal factors of the producers (organization of work, quality of management etc.).

In order to illustrate the development of the economic conditions and prices, in Table 1 we show the comparison of the price indices levels in the CR and SR which in summary characterize the economic conditions.

It is obvious from the table data that in the CR, there is a more favorable development of the prices of inputs into

Table 1. Inter-annual summary price indices in the Czech and Slovak Republics (CR and SR)

Indicator		1998/97	1999/98	2000/99
Prices of agricultural producers	CR	102.3	88.3	109.2
	SR	99.7	98.2	107.2
Prices of industrial producers of foodstuffs and beverages	CR	105.5	96.6	103.0
	SR	103.4	101.4	105.2
Consumer prices of foodstuffs and beverages	CR	104.6	95.2	101.7
	SR	105.8	102.7	105.2
Prices of inputs into agriculture	CR	98.2	93.6	110.2
	SR	104.1	104.1	109.2

Source:

The report on the state of in agriculture of the CR for 2000  
The report on agriculture and food industry in the SR (2001)

agriculture than in the SR. While in the CR the prices of inputs increased as late as in 2000 during the monitored period, in the SR we have been recording their permanent inter-annual growth.

On the other hand, after the inter-annual drop of the agricultural producer prices in the SR, the prices increased as late as in 2000, but their growth rate was lower than with the input prices. In the CR (except for 1999), the agricultural producer prices were gradually raising but their growth rate was lower (except for 1998) than that of the input prices.

### The development of costs, yields and economic result in the agricultural production branches

The costs per 1 ha a.l. in the agricultural production (Table 2) in the SR and CR slightly decreased during the monitored period (down to 97.4% in the CR and 98.8% in the SR). The common feature of this period was a divergent development in the plant and animal production branches. While in the CR and SR plant production branch the costs slightly increased, the animal production branch recorded their drop. The cost-decrease rate was higher in the CR than in the SR.

The animal production branch has been sharing the agricultural production costs to a greater extent in both republics. The animal production costs represent up to 60% of the agricultural production costs.

Based on the comparison in SKK, we have found out that in the CR, the volume of costs per 1 ha a.l. was higher by 26–40% than in the SR.

Another common feature of the cost-rate in both countries are inter-regional differences resulting mostly from different natural and economic conditions. In worse natural conditions, the costs per 1 ha a.l. reached approx. 50% share of the costs in better natural conditions. More expressive differences are recorded mostly in the plant production branches. The costs in worse natural condi-

Table 2. The development of the costs in the agricultural production branches in the CR and SR per 1 ha a. l.

Indicator	Country	1997	1998	1999	2000	Index 2000/97
Plant production	CR in CZK	14 219	14 079	14 072	14 513	102.1
	CR in SKK	15 143	15 445	16 830	17 372	
	SR in SKK	11 365	11 386	10 717	11 511	101.3
Animal production	CR in CZK	19 152	19 153	17 850	17 980	93.9
	CR in SKK	20 397	21 011	21 349	21 522	
	SR in SKK	16 756	17 085	16 316	16 273	97.1
Agricultural production	CR in CZK	33 371	33 232	31 922	32 493	97.4
	CR in SKK	35 540	36 456	38 179	38 894	
	SR in SKK	28 121	28 471	27 033	27 784	98.8

Source: Cost-demand of agricultural products in the agricultural enterprises of the CR for 1997, 1998, 1999, 2000  
Proper costs and economic results of the agricultural enterprises in the SR for 1997, 1998, 1999, 2000

Table 3. The development of yields in the agricultural production branches in the CR and SR per 1 ha of agricultural land (a.l.)

Indicator	Country	1997	1998	1999	2000	Index 2000/97
Plant production	CR in CZK	15 754	15 046	14 408	15 723	99.8
	CR in SKK	16 778	16 505	17 227	18 820	
	SR in SKK	12 936	11 895	11 227	11 479	88.7
Animal production	CR in CZK	17 125	17 577	16 304	17 681	103.2
	CR in SKK	18 238	19 282	19 500	21 164	
	SR in SKK	15 846	16 353	15 922	16 288	102.8
Agricultural production	CR in CZK	32 879	32 623	30 712	33 404	101.6
	CR in SKK	35 016	35 787	36 727	39 984	
	SR in SKK	28 782	28 248	27 149	27 767	96.5

Source: Cost-demand of agricultural products in the agricultural enterprises of the CR for 1997, 1998, 1999, 2000  
Proper costs and economic results of the agricultural enterprises in the SR for 1997, 1998, 1999, 2000

tions, e.g. in the SR, reached only 1/3 of the costs in better natural conditions. Inter-regional conditions are the reason why the share of the plant production falls in favor of the animal one towards worse natural conditions.

The yields per 1 ha a.l. developed differently during the monitored period (Table 3). In the CR, the agricultural production yields slightly raised (101.6) but in the SR they dropped (96.5). In both republics, the plant production yields dropped to the contrary of those in the animal production which slightly raised.

Similarly as with the costs, the share in the yields was higher with the animal production, mostly in the SR, than with the plant production.

Based on the comparison in SKK, we have found out that the agricultural production yields reached per 1 ha a.l. were higher by approx. 28.0–44.0% in the CR than in the SR.

Due to a different cost-yield development, economic result developed differently as well (Table 4). In the CR, after the loss which had been reached in 1997–1999, the profit reached CZK 911 per 1 ha a.l. already in 2000, while in the SR, this indicator was rather oscillating (the profit-loss oscillation). In 2000, because of unfavorable climatic conditions, the loss reached SKK 17.0 per 1 ha a.l. Nevertheless, the plant production branch was profitable

(resp. with a slight loss in the SR in 2000), but the animal production branch was loss-making in both republics. Finally in 2000, the SR animal production branch reached positive economic result of SKK 15.0 per 1 ha a.l.

Table 4. The economic result in the agricultural production branches in the CR and SR per 1 ha a. l.

Indicator	Country	1997	1998	1999	2000
Plant production	CR in CZK	1 535	967	336	1 210
	CR in SKK	1 635	1 060	397	1 448
	SR in SKK	1 571	509	510	–32
Animal production	CR in CZK	–2 027	–1 576	–1 546	–299
	CR in SKK	–2 159	–1 729	–1 849	–358
	SR in SKK	–910	–732	–394	15
Agricultural production	CR in CZK	–492	–609	–1 210	911
	CR in SKK	–524	–669	–1 452	1 090
	SR in SKK	661	–223	116	–17

Source:  
Cost-demand of agricultural products in the agricultural enterprises of the CR for 1997, 1998, 1999, 2000  
Proper costs and economic results of the agricultural enterprises in the SR for 1997, 1998, 1999, 2000

## The development of the cost-rate and profitability of the major agricultural products

### Plant products

Regarding plant products, we may state that a lower production intensity is reached in the SR, expressed by per hectare yields (Table 5). During 1997–1998, only the crops yields of wheat were higher in the SR than in the CR. With other plant products, within the entire monitored period, production intensity was lower in the SR than in the CR. Regarding cereals and rape, the per hectare yields level in the SR reached only 82% of the level in the CR, with sugar beet 96% and with potatoes only 62%. A more critical situation occurred mainly in 2000, when Slovak agriculture was more affected by the unfavorable climatic conditions. However the cost level (Table 5) per

1 ha of cereals and oil-plants (recalculated in SKK) was almost equal in both republics. In the SR, lower costs were spent per 1 ha of sugar beet but, to the contrary of this, the costs per 1 ha of potatoes in the SR were higher by 35–52% than in the CR. The set trends in per hectare cost and production intensity development caused that:

- 1 ton of cereals and oil-plants are produced more expensively in the SR than in the CR
- sugar beet (except for the unfavorable year 2000) is produced with lower unit costs in the SR than in the CR
- low crops of potatoes in the SR but considerably higher per hectare inputs than in the CR caused that 1 ton of potatoes was produced twice more expensively in the SR than in the CR.

The plant products were realised at higher prices in the SR, except for wheat and rape.

Table 5. The development of the intensity of the cost-demand and realization prices of the selected plant products in the CR and SR

Product	Country	Yield in t/ha	Cost per hectare	Yield in t/ha	Ø realiz. price	Yield in t/ha	Cost per hectare	Yield in t/ha	Ø realiz. price
1997					1998				
Wheat	CR in CZK	4.69	13 482	2 529	3 904	4.53	13 965	2 711	3 719
	CR in SKK		14 358	2 693	4 158		15 320	2 974	4 080
	SR in SKK	4.96	15 193	2 950	3 919	4.72	15 332	3 135	3 654
Barley	CR in CZK	4.35	12 200	2 385	3 450	4.07	11 436	2 391	2 871
	CR in SKK		12 993	2 540	3 674		12 545	2 623	3 149
	SR in SKK	4.00	12 743	3 048	4 039	3.87	12 540	3 097	3 588
Rape	CR in CZK	2.71	15 466	5 717	6 583	2.65	15 063	5 675	7 069
	CR in SKK		16 471	6 089	7 011		16 524	6 225	7 755
	SR in SKK	2.59	18 058	6 948	6 954	2.24	19 769	8 796	7 203
Sugar beet	CR in CZK	38.28	36 676	958	851	41.43	39 294	948	781
	CR in SKK		39 060	1 020	906		43 106	1 040	857
	SR in SKK	36.27	37 412	870	981	39.25	40 594	1 004	681
Potatoes	CR in CZK	23.38	58 866	2 518	2 353	25.64	61 881	2 413	2 502
	CR in SKK		62 692	2 682	2 506		67 883	2 647	2 745
	SR in SKK	16.57	84 898	5 124	3 478	18.71	94 487	5 050	5 130
1999					2000				
Wheat	CR in CZK	5.18	13 531	2 296	3 022	4.73	13 012	2 419	3 269
	CR in SKK		16 183	2 746	3 614		15 575	2 896	3 913
	SR in SKK	4.25	15 602	3 529	3 519	3.38	15 509	4 423	3 951
Barley	CR in CZK	3.94	11 533	2 487	2 272	4.29	11 350	2 250	2 879
	CR in SKK		13 793	2 974	2 717		13 586	2 693	3 446
	SR in SKK	3.29	12 036	3 504	3 452	2.24	13 052	5 619	3 886
Rape	CR in CZK	2.85	15 533	5 457	5 473	2.81	15 779	5 608	6 162
	CR in SKK		18 577	6 526	6 545		18 887	6 713	7 376
	SR in SKK	2.33	17 587	7 536	7 140	1.62	18 803	11 550	7 370
Sugar beet	CR in CZK	45.55	37 495	823	799	47.89	36 473	762	1 038
	CR in SKK		44 844	984	956		43 658	912	1 242
	SR in SKK	43.94	37 665	842	872	34.79	41 026	1 161	1 068
Potatoes	CR in CZK	22.14	62 427	2 819	2 943	26.29	63 621	2 420	3 106
	CR in SKK		74 663	3 371	3 519		76 154	2 897	3 718
	SR in SKK	13.62	88 067	6 464	6 177	17.85	116 485	6 528	6 155

Source: The cost-demand of the agricultural products in the CR agricultural enterprises in the years 1997, 1998, 1999, 2000  
Proper costs and economic results of the SR agricultural enterprises in the years 1997, 1998, 1999, 2000

Table 6. The development of profitability of the major plant products in the CR and SR (%)

Product/year	Country	1997	1998	1999	2000
Wheat	CR	54.4	37.2	31.6	35.1
	SR	32.9	16.6	-0.3	-10.7
Barley	CR	44.7	20.1	-8.6	28.0
	SR	32.5	15.8	-1.5	-30.8
Rape	CR	15.2	24.6	0.3	9.9
	SR	0.1	-18.1	-5.3	-36.2
Sugar beet	CR	-11.2	-17.6	-2.9	36.2
	SR	12.8	-32.2	3.6	-8.0
Potatoes	CR	-6.6	3.7	4.4	28.4
	SR	-32.1	1.6	-4.4	-5.7

Source:

Cost-demand of agricultural products in the agricultural enterprises of the CR for 1997, 1998, 1999, 2000

Proper costs and economic results of the agricultural enterprises in the SR for 1997, 1998, 1999, 2000

On the basis of the cost-rate and realised production price development, we may state that the production of cereals was profitable in both republics (except for the year 2000 in the SR). In the CR, production of rape and potatoes was also profitable to the contrary of the loss-making production in the SR. Sugar beet production in the CR was loss-making up to 2000 because it was realised at higher

prices. The sugar beet production profitability in the SR was oscillating (the profit-loss oscillation). The data on profitability are shown in the Table 6.

#### Animal products

The animal production branch in the SR was also reaching lower utility parameters than in the CR (Table 7). The utility in the SR reached only 93% of the value in the CR during the monitored period. For instance, the average milk production per 1 cow was by 360 l lower in the SR compared to the CR in 2000. Similar trends in the intensity development are shown also in the fattening of cattle and pigs but the increments in the cattle fattening slightly raised but still reached only 97% of the increment level in the CR. A different situation was in the pigs fattening when the increments dropped in the last period and reached 84% of the increment level in the CR.

Based on the comparison of the costs per 100 heads of cattle (Table 7), we have found out that the SR spends less costs for milk production but more costs per 100 heads of cattle in the cattle fattening.

From the stated development of the production intensity and cost-rate of the selected animal production items, it is obvious that:

- in milk production, more costs per 100 heads of cows were spent in the CR than in the SR. Despite a higher utility in the CR, 1 liter of milk was produced in the SR with approx. by 5% lower costs than in the CR,

Table 7. The development of the utility, cost-demand and realization prices of the selected animal products in the CR and SR

Products	Country	Utility in l, kg l.w.	Costs per 100 cattle	Costs per 1 kg l.w.	Ø realiz. price	Utility in l, kg l.w.	Costs per 100 cattle	Costs per 1 kg l.w.	Ø realiz. price
1997					1998				
Milk	CR in CZK	4 490	11 263	8.31	6.48	4 771	11 648	8.08	7.25
	CR in SKK		11 995	8.85	6.90		12 778	8.86	7.95
	SR in SKK	4 124	10 702	8.52	7.41	4 450	11 482	8.53	8.09
Fattening of cattle	CR in CZK	76.68	3 081	46.15	34.84	79.15	3 066	43.41	38.26
	CR in SKK		3 281	49.15	37.10		3 363	47.62	41.97
	SR in SKK	70.07	3 856	47.44	37.92	74.40	4 053	48.61	37.89
Fattening of pigs	CR in CZK	62.06	1 707	35.54	34.30	63.13	1 669	35.48	33.66
	CR in SKK		1 818	37.85	36.53		1 831	38.92	36.93
	SR in SKK	56.55	2 006	39.78	39.56	58.67	1 997	40.55	39.52
1999					2000				
Milk	CR in CZK	4 993	12 034	7.93	6.04	5 125	12 230	7.91	7.37
	CR in SKK		14 393	9.48	7.22		14 639	9.47	8.82
	SR in SKK	4 620	11 835	8.51	7.76	4 767	13 052	9.16	8.43
Fattening of cattle	CR in CZK	82.33	3 077	42.00	35.07	82.74	3 339	44.08	38.34
	CR in SKK		3 680	50.23	41.94		3 997	52.76	45.89
	SR in SKK	81.21	4 176	50.10	38.58	80.55	4 403	50.27	41.95
Fattening of pigs	CR in CZK	63.85	1 506	29.73	29.68	65.40	1 571	30.07	33.22
	CR in SKK		1 801	35.55	35.49		1 880	35.99	39.76
	SR in SKK	57.59	1 866	39.68	37.86	54.97	1 927	42.25	41.99

Source: The cost-demand of the agricultural products in the CR agricultural enterprises in the years 1997, 1998, 1999, 2000  
Proper costs and economic results of the SR agricultural enterprises in the years 1997, 1998, 1999, 2000

Table 8. The development of profitability of the major animal products in the CR and SR (%)

Product/year	Country	1997	1998	1999	2000
Milk	CR	-22.0	-10.3	-23.8	-6.8
	SR	-13.0	-5.2	-8.8	-7.9
Fattening of cattle	CR	-24.5	-11.9	-16.5	-13.0
	SR	-20.1	-22.1	-23.0	-16.6
Fattening of pigs	CR	-3.5	-5.1	-0.2	10.5
	SR	-0.6	-2.5	-4.6	-0.6

Source:

Cost-demand of agricultural products in the agricultural enterprises of the CR for 1997, 1998, 1999, 2000

Proper costs and economic results of the agricultural enterprises in the SR for 1997, 1998, 1999, 2000

- a different situation was in the cattle fattening. At a higher utility in the SR but slightly higher costs per 100 heads of cattle, 1 kg l.w. was produced somewhat cheaper in the SR than in the CR,
- a different situation was in the pigs breeding. Due to a lower utility in the SR but higher costs per 100 pieces of pigs, 1 kg l.w. was produced with higher costs in the SR than in the CR.

By comparing the price development (recalculated to SKK), we have found out that in Slovakia, the producers realised milk and pork at higher prices than in the CR (except for milk in 2000). In the SR, cattle was realised at lower prices in average than in the CR.

At the reached cost and price levels of the realised production in the monitored years, the compared animal products were realised unprofitably in both republics. The profitability was reached only in the CR in 2000, in the fattening of pigs (Table 8).

## CONCLUSION

The cost comparisons per 1 hectare of agricultural land in the Slovak Republic and in the Czech Republic have shown that the costs of agricultural production have fallen mildly for the evaluated period. In both republics the costs of vegetable production have fallen mildly and so have in the animal production. The Czech Republic has expended 26 to 40 per cent more costs per 1 hectare of agricultural land than Slovakia.

The yields per 1 hectare of agricultural land have grown slightly in the Czech Republic, but have fallen in Slovakia. The yields in vegetable production in both republics have fallen, but went up in animal production. The Czech Republic has been able to achieve higher lev-

el of yields per 1 hectare of agricultural land than Slovakia (by approximately 28 to 44 per cent).

As a result of different development of yields and costs, the economic results (profit/loss) have also developed differently. The Czech Republic has experienced loss per production on 1 hectare of agricultural land until 1999 but profit in 2000. In Slovakia profits and losses have been alternating over the years in question. The animal farming has been making losses in both republics (except in the Slovak Republic in 2000). Profits have been achieved in both republics as far as vegetable production is concerned (Slovak Republic has experienced a mild loss in 2000).

The costs per hectare of cereals and oil vegetables production have been almost the same in both republics. The Slovak Republic has expended less costs per hectare of sugar beets. On the other hand Slovakia has expended about one half more for one hectare of potatoes than the Czech Republic. The development of costs, of the price level and of the intensity of production have lead to profitability of cereal production in both republics. The Czech Republic has been able to produce colza and potatoes with profit, while the Slovak Republic has been making losses in this production. Sugar beet has been produced with losses in the Czech Republic, while in Slovakia profits have been alternating with losses in this production.

In animal farming lower costs has been achieved per 100 cows in milk production in the Slovak Republic, but more costs in beef and pork production. Slovakia has achieved lower parameters of effectiveness, but milk and pork has been sold at higher prices in Slovakia than in the Czech Republic. On average beef has been sold at lower prices in the Slovak Republic. The animal products have been produced with losses at this cost and price level, and production intensity in both republics.

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Arrived on 19<sup>th</sup> July 2002

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