



Prospects for environment friendly livestock production in Slovenia

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ABSTRACT

This paper aims at an assessment of Slovenian livestock production potential in light of approaching EU accession. Emphasis is given to environment friendly production, taking into account current production structures and anticipated agricultural policy after accession. Economic effects of different accession scenarios have been studied, applying APAS-PAM methodology. Results reveal importance of negotiation outcomes for Slovenian livestock production. Programmes for environmental and landscape assistance will have much higher impacts on future livestock production and proportion of recognised environment friendly farms than at present.

(Keywords: livestock production, EU accession, economic forecasts, Slovenia)

INTRODUCTION

The next European Union (EU) enlargement will have multiple impacts on candidate countries agriculture. As previous enlargement shows, farmers will have to adjust their quantities supplied, shift products and modernise in order to be competitive. Price movements due to harmonisation will probably change competitiveness and influence trade balance. Moreover, even small price variations and minor modifications in budgetary support may dramatically change the level of income earned by producers on both sides (in “old” and “new” member states), which can, in the end, lengthen the integration process for new member states. Assessment of market and income effects has been a subject of numerous studies (*Banse, 2000; Münch, 2000; European Commission, 2002a*). Their common message is that enlargement and full adoption of CAP measures by the candidate countries would lead in most of them to increased production levels and improved income position of agriculture.

The conclusions of the Berlin Summit of March 1999 and the European Commission negotiation strategy of 30th January 2002 clearly defined the financial framework of EU enlargement in the area of agricultural policy. The figures reveal that the newly-coming Member States will not be fully participating in CAP direct payments. The reason lies on lower current price levels as well as potentially negative social and macroeconomic effects in candidate countries. In addition, higher prices are expected to be a stimulus to growth of agricultural production in the new members, and this could consequently create serious additional budget pressures on CAP. The same argumentation for a two-tier agricultural policy after EU enlargement is expressed also by *Pouliquen (2001)*. Therefore, it is clear that the issue concerning budgetary payments is on top of the political agenda in the negotiating process of the next EU enlargement.

The significance of the agricultural sector in Slovenia is relatively small, accounting for around 3.5% of GDP and 6% of total employment after transition, with a further decreasing rate over the last four years. Contrary to other candidate countries, producer prices in Slovenia are almost at the EU level and due to the natural and structural conditions, Slovenia is a net importer of food, with a smaller potential for production growth. Private-owned land is mostly divided between 86 thousand small, mainly part-time family farms (Agricultural census 2000 data, according to Eurostat definition) with an average farm size of 5.2 ha utilised agricultural area (UAA). Few agricultural enterprises have evolved from the formerly “social” agricultural estates. Detailed farm size structure in 2000 along with share of farms with livestock is presented in *Table 1*. 7 out of 8 Slovenian farms have less than 10 ha UAA and less than 10% of farms have no farm animals.

Table 1

Farm structure and frequency of livestock on Slovenian farms in 2000

Farm size (UAA, ha)	Number of farms	%	Number of farms with livestock	%
Landless	44	0.1	44	0.1
> 0 to 2 ha	23363	27.0	17538	22.6
> 2 to 10 ha	52188	60.4	49434	63.7
> 10 to 50 ha	10700	12.4	10493	13.5
> 50 to 100 ha	98	0.1	86	0.1
> 100 to 500 ha	59	0.1	35	0.0
> 500 ha	15	0.0	7	0.0
Total	86467	100	77637	100

Source: special processing of agricultural census data (SORS, 2002)

The level of support for agriculture in Slovenia is significantly higher than in any other candidate country. PSE estimates by OECD (2001) show that for the whole period of 1992-1999 Slovenian producers were subsidised. It is apparent that market price support represented more than 80% of total agricultural support. In 1995-1999, average percentage PSE in Slovenia (41%) was above the OECD level (35%) and nearly the same as in EU (42%). The high PSE levels in Slovenia reflect substantial domestic price support and border protection for the most important agricultural commodities (milk products, beef and pork), as well as steadily growing budgetary transfers to producers. In addition, the Slovenian agricultural policy framework (objectives and measures) is already close to that of the CAP. Direct payments and intervention mechanisms (but not quotas), introduced by the 2000-2002 agricultural policy reform, aim to adjust domestic policy to such a degree that accession will not yield dramatic modifications for producers.

The objective of this paper is to contribute to the discussion on EU enlargement with the estimation of the possible impacts (production trends, agricultural income and competitiveness) for the livestock sector in Slovenia. By the use of relevant empirical tools it is tested whether Slovenian animal farming will actually depend on the level of EU direct aids and other budgetary provisions after accession. Emphasis is given to prospects for most of family farms with relatively low concentration of animals per area farmed. In the second part of the paper a crude estimation of Slovenian livestock

production, which could be characterised as low input and therefore close to environment friendly, is carried on. The paper concludes with discussion on likely development of Slovenian livestock production and opening of some dilemmas, which should be solved before Slovenian accession to the EU.

MATERIALS AND METHODS

The accession simulation part of the analysis is based on a synthetic-type, multi-market, partial equilibrium model APAS (Agricultural Policy Analysis Simulator) together with a policy analysis matrix (PAM) to explore agricultural price and trade policy options in Slovenia. The APAS is designed as a national sector model, taking into account the specific features of Slovenian agro-industry and recent policy changes (Kavčič, 2000). It is primarily focused on market projections. On the other hand, PAM has been used for analysing income, protection and competitive issues for the same policy scenarios.

The model includes all most important agricultural "PSE commodities" (arable crops: wheat and maize, barley and sugar beet; livestock products: milk, beef, pork and poultry, eggs and sheep meat). Together these commodities account for approx. 80% of Slovenian gross agricultural output. In this paper only livestock production model results are presented. Data and scenarios for APAS-PAM modelling are described by Kavčič (2002).

Estimation of low, medium and high input share of Slovenian livestock production has been carried out on the ground of modified FAO approach (FAO, 2001). FAO definitions are not very precise and one can expect that "production environment", judged as high input in some part of the world (i.e. Subsaharan Africa), will be treated as medium input or even low input in Western Europe. Therefore, one can expect that personal judgement will have high impact on information obtained from some statistical sources of data.

Approach that can not avoid this subjective opinion about the level of human intervention, has been extensively discussed in a group of Slovenian livestock experts and judged to be most appropriate for application in Slovenian situation as it stands (i.e. data availability). Classification of farms has been done in two steps. The first stage involves farms' classification into four operation types, what has been done on the ground of herd size (as proxy of farms market orientation), followed by second division into "production systems" within already calculated number of households. Subsistence farms are certainly less managed/modified by human intervention, therefore (as a rule) the highest share was allocated as low input production system. Opposite is true for large scale commercial farms. For each species separate distribution criteria have been proposed and discussed with local experts. Special attention in discussion is paid also to the fact that 60% of Slovenian farms have on their farmyards 2 or even more livestock species (Table 2).

Table 2

Number of animal species* on Slovenian farms

Number of species	0	1	2	3	4	5	6	7	8	9
Number of farms	11858	23719	36220	11439	2567	515	120	27	1	1
Share (%)	13.7	27.4	41.9	13.2	3.0	0.6	0.1	0.0	0.0	0.0

*Only 10 most important species listed in table 10 included in tabulation

RESULTS AND DISCUSSION

Detailed scenario results of likely EU accession impacts for Slovenian agriculture has been already presented elsewhere. The most recent results can be found in *Erjavec et al. (2002)* and *Kavčič et al. (2002)*. Therefore, here are presented only the most interesting one, related to production, income and competitive issues, which are most closely connected also with the topic of this paper - namely, to likely prospects for Slovenian livestock production. Model results for livestock production are summarised in *Tables 3, 4, 5* and *6*. They refer to year 2004, the year of expecting Slovenian accession to the EU.

Mainly due to price and budgetary revenue disparities, assumed by both accession scenarios, some significant changes in livestock production can be predicted even in the short run (*Table 3*). Pork, poultry and eggs production would be affected most by the price reduction, while milk production would be reduced due to quotas imposed. Only beef production is expected to increase significantly or - under least favourable conditions, which are more realistic - at least not drop. The extent of change depends strongly on compensation eligibility (number and level of premium rights).

Table 3

Projected domestic livestock production under various policy scenarios (BS=100)

Scenario	Milk	Beef	Pork	Poultry	Eggs	Sheep meat
EUE+	98.2	114.4	97.1	99.0	92.8	101.0
EUE-	90.4	113.3	93.1	92.0	77.6	102.1
EUP+	86.0	102.1	97.6	99.6	93.2	95.8
EUP-	86.0	100.3	93.7	92.6	78.1	93.4

The results of the policies under the optimistic EUE+ scenario point to a slight or even significant improvement in the income situation of many sectors, including that of dairy farmers (*Table 4*), when expressed per unit of production. But the projection is the opposite in the case of more likely EUP. scenario. Income deterioration is certainly much higher, when taking into account production quotas in calculation of sector income (*Table 5*).

Table 4

Likely agricultural income situation and rate of production rentability

	Scenario	Milk	Beef	Pork	Poultry	Eggs	Sheep meat
Income (EUR/hd*)	BS	1,088	137	221	25	178	491
	EUE+	1,100	408	220	-24	-5	731
	EUE-	889	378	145	-192	-282	782
	EUP+	1,049	172	184	-31	-19	493
	EUP-	848	149	114	-198	-292	461
Rentab. (%)	BS	110	82	87	95	94	84
	EUE+	111	110	87	91	82	103
	EUE-	99	107	80	79	62	107
	EUP+	108	85	84	91	81	84
	EUP-	96	82	78	79	61	82

*10 pigs or sheep, 10,000 chickens or 100 layers

A significant improvement, but conditioned upon direct payments, is expected only in currently discriminated beef and potentially sheep meat production. Situation is expected to be the worst in poultry and egg sectors. In the case of non-competitive food processing industry, a rapid stagnation of intensive livestock production is expected.

Table 5**Sector and aggregate agricultural income forecast (BS=100)**

Scenario	Milk	Beef	Pork	Poultry	Eggs	Sheep meat	Aggregate
EUe+	99	340	96	-93	-3	150	129
EUe-	74	312	61	-706	-123	163	105
EUp+	83	127	81	-123	-10	96	87
EUp-	67	109	48	-732	-128	88	64

In the case of realisation of the current Commission proposal (*European Commission*, 2002b), farmers' incomes at the aggregate level will significantly deteriorate in comparison with the baseline scenario. Should direct payments as assumed under EUe. be granted and prices of commodities remain relatively high (EU.+ scenario), the income situation will be improved, what is projected also in *European Commission* projection (2002a). On the contrary, it will decline dramatically with the proposed starting level of direct payments (25% + top ups) and without a significant increase (to the EU average level) of competitiveness of the domestic food industry. The difference between the quasi equal treatment accession scenario (EUe+) and the baseline one is very significant - approximately 29%, but deterioration under more realistic EUp+ is around 13%, and under also highly probable EUp- even 36%. The situation to be expected if nothing crucial happens by the end of accession negotiations is somewhere between EUp+ and EUp-, therefore the income reduction in the rank of a quarter.

Domestic resource cost ratio (DRC) and the rate of bilateral competitiveness (RBC) were estimated for all products under consideration. Results obtained are presented in *Table 6*.

Table 6**Indicators of competitiveness for key livestock commodities**

	Scenario	Milk	Beef	Pork	Poultry	Eggs	Sheep meat
DRC	BS	1.71	4.88	3.48	1.21	3.22	2.93
	EUe+	1.71	3.71	1.07	1.39	1.78	2.88
	EUe-	2.10	5.01	1.29	3.09	10.87	3.88
	EUp+	1.70	3.71	1.07	1.39	1.78	2.88
	EUp-	2.09	5.01	1.29	3.09	10.87	3.88
RBC	BS	0.75	1.12	1.02	0.73	0.82	1.09
	EUe+	0.74	0.65	1.04	0.80	1.12	0.81
	EUe-	0.87	0.68	1.23	1.29	3.02	0.77
	EUp+	0.77	1.03	1.11	0.82	1.15	1.09
	EUp-	0.91	1.11	1.31	1.31	3.16	1.14

RBCs show relatively favourable competitive position of Slovenian agriculture in the event of non-discriminative EU agricultural policy environment (EUe+), conditioned upon (competitive) domestic food industry. Opposite is the case in a liberalised situation on agricultural markets (DRCs above 1 or even negative, with no exemption). Differences between various commodities are obvious. Cattle (dairy and beef) production under subsidised CAP regime seems to be more competitive than pork, poultry, eggs and sheep meat production. The reasons for this are mainly high direct payments and/or highly protected markets, resulting in high revenues in proportion to domestic opportunity costs. Sheep meat production with relatively small direct payments (EU_p) is unlikely to be competitive. Pork, eggs and poultry production is far from being competitive under speculation of non-competitive domestic food industry. It is important to stress that EU accession - even under equal treatment scenario - would not significantly improve the competitiveness of great majority of investigated commodities. In cases where RBC ratio decreases under EU_p in comparison with baseline (only beef), it is a consequence of still high discrepancy between domestic agricultural policy and the current CAP. For many commodities, the competitiveness of the food processing industry with lower or higher prices for rough materials could have much greater impact on the economic situation of agricultural production than agricultural policy environment itself.

Results obtained for main species applying procedure for classification of livestock farms into input intensity production systems are summarised in *Table 7*.

Table 7

Distribution of Slovenian livestock production by production systems (%)

Species	No. of farms	Share of farms with livestock			Livestock population (000)	Share of livestock population		
		Low input	Medium input	High input		Low input	Medium input	High input
Cattle	56,097	42.2	39.7	18.1	500	27.7	48.5	23.8
Sheep	4,330	73.5	23.8	2.6	96	59.2	36.4	4.3
Goats	4,775	78.1	20.3	1.6	29	60.9	32.5	6.6
Horses	4,634	18.4	54.7	27.0	14	15.1	58.2	26.7
Pigs	44,623	69.7	23.4	7.0	602	19.2	11.9	68.9
Chicken	56,687	52.7	39.2	8.1	5,835	5.5	5.8	88.7
Turkey	1,361	42.2	47.3	10.5	200	1.4	2.2	96.4
Ducks	2,771	41.9	48.9	9.2	20	27.6	49.9	22.5
Geese	908	46.2	46.9	6.8	4	34.8	48.7	16.5
Rabbits	12,682	68.1	22.4	9.4	180	49.5	31.9	18.5

Discrepancy between distribution of farms and according to population is obvious for all species with exemption of horses. Almost opposite picture is noticed in the case of pigs and poultry, where relatively small number of large farms has important share of the whole population. In these circumstances of highly concentrated livestock production it is difficult to talk about environment friendly and animal welfare production. On the other side extremely low share of high input production systems is significance of small ruminant production (sheep and goats). Almost normal distribution is noticed in cattle population as economically most important livestock sector (nearly half of total agricultural income in Slovenia comes from milk and beef production), but still with

important share of low intensity farms. Most of low input and many of medium input farms are eligible to claim for special budgetary support under current CAP. This is also the feature of current Slovenian agricultural policy.

CONCLUSIONS

APAS-PAM model results show the sensitivity of Slovenian livestock production on accession conditions. The accession with relatively low level of direct and structural payments and considering low competitiveness of the food industry is far from being attractive for Slovenian producers. The general picture is even the opposite to the one that can be expected taking into account several general conclusions about EU enlargement effects. In the case of no eligibility for the whole amount of direct payments (equal treatment as current Member States), accession means a reduction of total agricultural income with enormous deterioration within some sectors (pork, poultry and eggs) and slight improvement only in currently discriminated beef sector.

Income assistance for environment friendly production seems to be much more important in the near future, when many of farmers will find it difficult to keep current income level in economic environment of decreasing producer prices, constrained milk production and very limited number of premium rights. Many of part time and more risk averse farmers will still have on their farmyards more livestock species, what usually have negative economic consequences (higher production costs). On the other side this kind of production easily follows multi-functional concept of agriculture and usually gives higher level of satisfaction to non-professional animal holders. Since such livestock production is treated as more sustainable way of natural resources utilisation, it is also easier to get public funds for supporting so called environmental programmes. In conditions prevailing in Slovenian agriculture it seems socially justified to support farmers seeking their opportunity in low input sustainable systems of farming. This especially holds for cattle, sheep and goats production to preserve already overgrown natural landscape.

It is expected that dispersed farm structure will prevail in Slovenian livestock production for a long time after EU accession, with important share of non-professional farms not only by number, but also by their contribution to volume of production and particularly by their importance in providing non-production functions and services to the society. This has to be reflected in the outcome of accession negotiations, enabling necessary budgetary support for production in less favoured areas and for sustainable type of farming.

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