



## Profitability of livestock farms in Croatia

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### ABSTRACT

*Economic efficiency and competitiveness of the agricultural production is necessary condition in the integration processes. Efficiency, competitiveness and sustainability are difficult to estimate on the complex systems as family farms are. Based on the project "Farm Survey" and according to the EU methodology (standard gross margin), family farm typology in the Croatia is established. Objectives of the paper are to determine basic production and economic characteristics of the livestock farms and economic indicators for business analysis. For that purpose economic indicators (primary profitability) and descriptive statistics methods will be used. Preliminary results showed that livestock farms (general types grazing livestock and granivores) participate with 32% out of total (n=892 farms) and mixed livestock holdings with 23%. Significantly higher agricultural income was recorded in the specialist granivores type. In the general type grazing animals, deeper analysis is necessary because bigger variety of the results between regions as well as between family farms in the same region. Average agricultural income in the general type grazing animals was 3573.90€. In the principal types cattle-dairy, rearing and fattening and sheep, goats and other grazing animals income was 6669.60€ and 9581.10€ respectively. Specialist granivores in average earned 6200€ (the specialist poultry 10121.40€). On the mixed livestock holdings agricultural income was 4567.22€ without significant variation between principal types. (Keywords: profitability, family farms, livestock production, typology)*

### INTRODUCTION

Comparing with European Union, livestock production in Croatia is low regarding yield as well as quality (Par *et al.*, 1999). Production is self sufficient with small per cent of commercial, market oriented family farms. And just those farms should be precondition for efficiency and competitiveness on European and World market. Farm Survey project results shows importance of livestock production on family farms in Croatia (Par, Zimbrek, Juracak, 1999). Just for illustration, 70% of family farms in sample (n=892) posses cow, 22.9% produce calves and 16.9% fatten calves. Average production per cow is small, 2053 litre (includes sold milk and consumption on households). In the same time family farms typology in Croatia (Njavro, 2001) showed that 31.52% of family farms can be insert in animal production (specialist grazing livestock and specialist granivores) while 23.02% are in some kind of mixed livestock holdings. Regarding to economic size classes of holdings, livestock's farms prevails in very small (37%) and small economic size class (32%).

*Objective of paper* is presentation of production and economic characteristics of family farms and reached level of profitability. Later, results will be compared with results of other family farm types and with other economic sectors in Croatia. Profit is

determined on three levels: region, type of farming and economic size of holding. Family farms profitability was analysed by *Par* and *Juracak* (1999). They conclude that profitability is low and strongly influence on sustainability of agricultural production, while sustainability of households is insured through off-farm income. Starting from hypothesis that inefficient and inadequate competitiveness danger sustainability of whole farm, proposals and recommendations are given.

## MATERIALS AND METHODS

Data used in this paper are data collected on permanent project "Farm Survey". Project has started in 1998 with the goals for determination of main capable resources on farms, production and development level. Sample was drawn from Census 1991 and according to the following rules: at least four hectare of arable land, at least one family member full-time employ on farm and significant agricultural production. Based on mentioned criteria from total of 525.253 family farms, 75000 family farms were chosen and in sample were drawn 892 of them. Survey takes place on complete Croatian territory, and for the purpose of survey territory is divided on four regions: Pannonia-eastern part, Pannonia-western part, Hilly-mountain region and Mediterranean region. Family farm typology (type of farming and economic size) used in paper has foundation in European Union methodology. Income is determined on two levels: *gross farming income* and *Net household income*.

### Scheme 1

#### Gross farming income

Farming revenues		Farming Expenditures	
		-	Paid labour
+	Sale of agr. products	-	Production costs
+	Household consumption	-	Land rent
+	Subventions	-	Machinery direct costs
+	Other revenues	-	Overheads
		-	Taxes and contributions

**Gross farming income = Farming Revenues - Farming Expenditures**

### Scheme 2

#### Household income structure

+	Gross farming income
+	Income from other activities inside household
+	Income from activities outside household
+	Other net household revenues
=	<b>Gross household income</b>
-	Depreciation
=	<b>Net household income</b>

Farm resources value includes all long-term assets for agricultural production (agricultural land, machinery and equipment, permanent crops, buildings and breeding livestock). In the profitability calculations gross farm income was decreased for the depreciation value (*farming income*) while the net household income stay same as in Project. *Engaged means* are consisted of farm resources value and current assets (Farming Expenditures)

Profitably was determined on two ways (by two indicators):

1) as ratio between farming income and engaged means:

$$r_1 = \frac{DP}{AS}$$

DP=farming income and

AS=engaged means

2) As ratio between net household income and engaged means:

$$r_2 = \frac{NDK}{AS}$$

NDK=net household income

For data analysis descriptive statistic were used while for profit calculations we used farm and enterprise budgeting methods.

Monetary values are expressed in Euro. Average exchange rate (Croatian National Bank) in 1999 was 1€=7.579622 HRK.

## RESULTS AND DISCUSSION

Out of total 892 family farms, 652 are placed in some type of farming connected with livestock production. "Specialist granivores" type includes 225 family farms, while mixed holdings (mixed livestock holdings and mixed crops-livestock) includes 203 and 170 family farms. Number of holdings in specialist granivores type (pigs and poultry) is small (n=53). Animal production, in line with tradition, is mostly represented in Pannonian region-west part (n=394), and then in Pannonian region-eastern part (n=165), Hilly-mountain region (n=77) and Mediterranean region (n=15). Livestock farms used, in average, 10.255 hectares of own land while rent makes 17% in the structure of totally used land. Family farms are not heavily indebted, debt-to-asset ration is 5.9%. Index of specialisation for all farm types is 2.3. Demographic picture is very unfavourable. "Head" of household has, in average, 60 years old and in the most of cases only with primary school finished.

### **Income and farm resources value in livestock farms**

Average farm income on surveyed livestock farms was 2404.08€. Highest income was earned in eastern part of Panonian region (2960.03€) and lowest in western part of Panonian region (2126.88€). Analysis according to the types of farming showed that the highest income was on mixed livestock farms (3039€) and the lowest on specialist grazing animals type with only 1130.17€. Average net households income on livestock family farms in the Republic of Croatia in the year 1999 was 5901.00€. The highest net household income was recorded in the Mediterranean region, while the lower average was in eastern part of Panonian region. Lowest net household income had mixed crop-livestock farms. It can also be illustrated that the biggest gap between farm and net

household income appeared in specialist grazing animals types and mixed livestock holdings. Average value of engaged means was 53404.35€. Very high value in Mediterranean region (112671.50€) is results of high land value in that region. As it was expected, the highest value is recorded on specialist granivores types (pigs and poultry) 60535.83€.

**Table 1**

**Farm Income, Net Household Income and Engaged means (€)**

Region	Number of family farms	Farm income	Net household income	Engaged means
Croatia	651	2404.08	5901.27	53404.35
Panonia-eastern part	165	2960.03	5171.18	61437.76
Panonia-west part	394	2126.88	5627.84	45479.29
Hilly-mountain region	77	2671.95	7761.98	63705.50
Mediterranean region	15	2194.62	11562.71	120322.60

**Table 2**

**Farm Income, Net Household Income and Engaged means of General Type of Farming (€)**

General type	Number of family farms	Farm income	Net household income	Engaged means
Specialist grazing livestock	225	1130.17	5800.14	57286.75
Specialist granivores	53	2784.71	7703.77	60535.83
Mixed livestock holdings	203	3093.30	6178.57	45409.27
Mixed crops-livestock	170	3148.47	5142.03	55589.60

**Table 3**

**Farm Income, Net Household Income and Engaged means due to Economic Size Classes (€)**

Economic size classes	Limits in european size units	Nuber of family farms	Farm income	Net household income	Engaged means
Very small	2	114	2848.73	4522.07	29532.00
	4	192	1347.07	4750.12	40978.52
Small	6	132	2035.33	6160.32	46201.83
	8	74	2995.56	5771.00	68287.97
Medium low	12	77	4544.91	8296.40	75724.07
	16	22	1957.86	7206.61	82470.58
Medium high	40	30	3147.94	9981.53	112613.99
Large	100	10	385.90	7715.51	135623.33

**Profitability**

Conducted research showed higher profitability on farms with mixed productions as the result of lower farm resources value. Average profitability indicator r1 on family farms with livestock production was 6.58% and average r2 was 17.32%. The fact that profitability indicator r1 on family farms with mixed production (mixed livestock holdings: 8.47% and mixed crop-livestock:7.58%) is higher than the same indicator on specialist farms (specialist grazing animals: 4.05% and specialist granivores: 6.51) could be explained with insufficient production efficiency and insufficient capacities use. In the same time indicator r2 is higher on specialised livestock farms. It is result of incomes from other activities inside and outside of household. The fact that resources are not optimally used illustrates the r1 and r2 indicators in very small and small economic size classes. Namely, they are higher than those in upper economic size classes.

**Table 4**

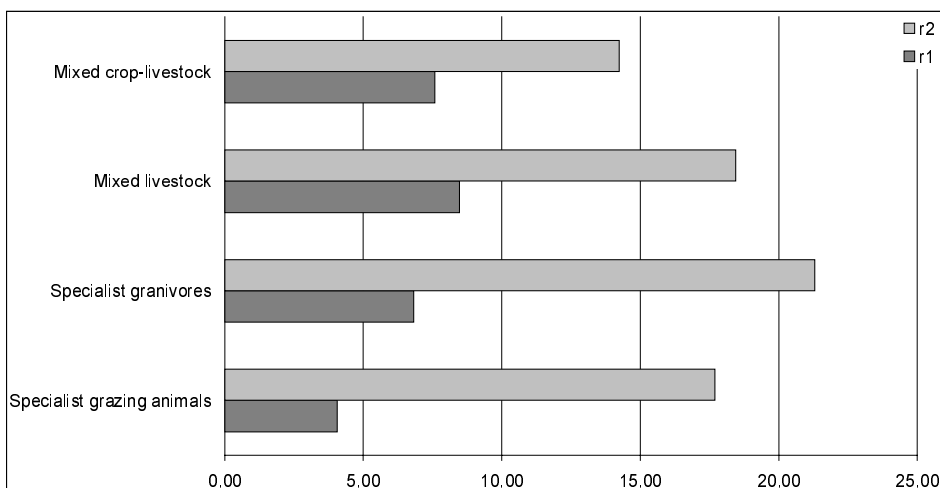
**Family farms profitability (1999)**

	Farm income	Net household income	Engaged means	r1	r2
Croatia-all types	2273.12	6046.32	61095.98	5.94	16.73
Livestock production	2404.08	5901.27	53404.35	6.58	17.32

Extremely low profitability indicator r1 in specialist grazing animal’s type is result of negative profitability in fattening calves production and low r1 in sheep, goats and other grazing animals types (r1=0.17%). Profitability in the specialist granivores type is mainly due to results in special pigs type (r1=7.63%) but in specialist poultry (r1=2.22%)

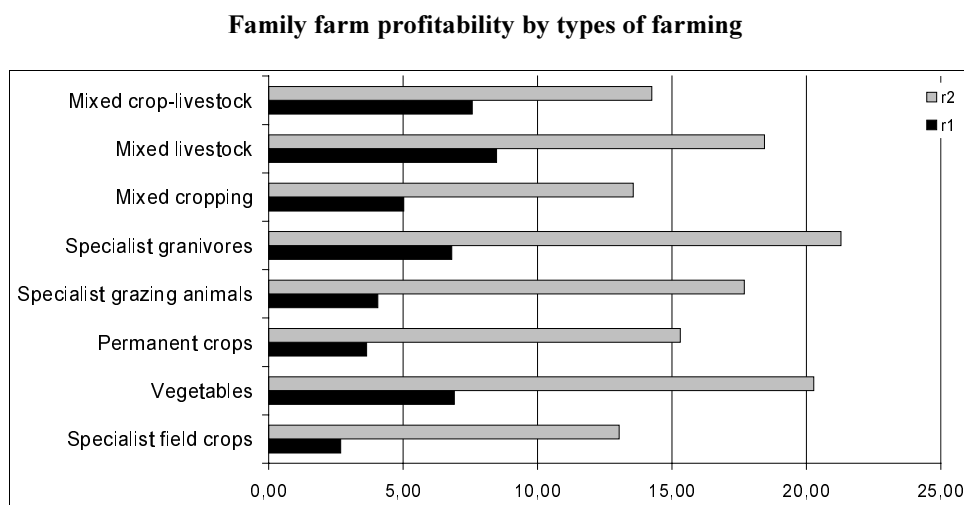
**Figure 1**

**Profitability indicators r1 and r2 on livestock farms**



ANOVA analysis showed statistically significant difference between profitability indicator r1 regarding regions (F=0.259, Sig.:0.855) and regarding general type of farming (F=2.202, Sig.=0.087). Profitability indicator r2 is statistically significant regarding general type of farming (F=1.963, Sig.=0.118). Significance level was 0.05. Mentioned results put agricultural production and sustainability of livestock farm in question while the households sustainability must be insured through other source of income outside agriculture. In the year 1999 credit rates of business banks were, in average, 15% and deposit rates of business banks, 4.13% to 4.31%. With this credit rates level it is obvious that livestock production can't be competitive. Research also showed that more specialised production is not necessary more profitable.

**Figure 2**



## CONCLUSIONS

Profitability on the family farms with livestock production is low. Profitability on the household level is important for the survival of household. Despite selection criteria in the sampling procedure that tried to select commercial, market oriented farms, results showed that agriculture, in many of cases, is not main source of income.

Reasons for such results (we take in consideration only internal factors) can be listed as follows: low productivity by hectare and by livestock unit, inappropriate organization of production as well as organization of farm, slow adoption of modern technology. With current level of profitability any serious investment cannot be done. Existing problems in livestock production in Croatia can be solved with coordinated cooperation between farmers, scientists, agribusiness industry, banks and governments institutions (ministries, extension service etc.).

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