

Economic analysis of typical farm types cultivating products for which Macedonia has very suitable production conditions

- Lamb meat

July, 2008



1. Objective

1. Development of a sector - regional model for:

- Estimation of incomes - situation of typical agricultural enterprises (farm aspect)
- Estimation of the competitive ability of products (farm aspect)
- Calculation of production quantity (outputs) and input of production factors (market aspect)
- Recommendations and directions for future strategy for development of the agricultural policy (development aspect)

2. Development of an information system for farm management - Farm Management Information System (FAMIS) for calculation of efficiency indicators on farm level and sector level

- Gross Margin
- Profit
- Quantity of production

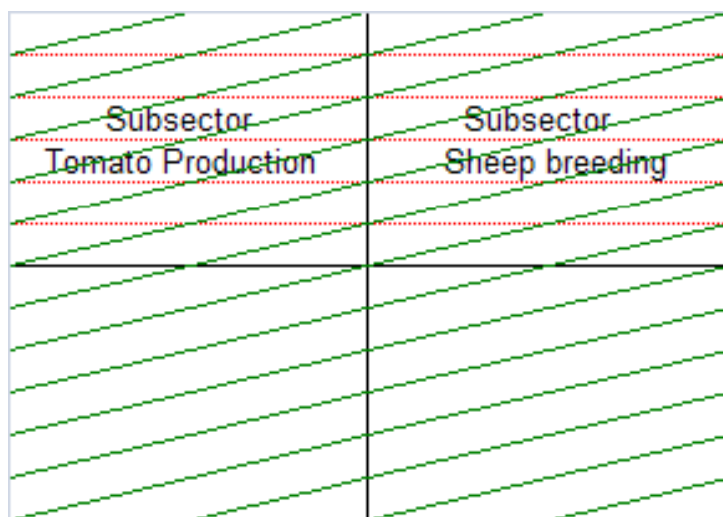
1. Objective

3. Analyses of sheep farms in selected regions
 - A. East agricultural region – Berovo (**Region III**) and
 - B. West agricultural region – Gostivar (**Region IV**)
4. Comparison of the competitive ability of sheep meat (Region III and Region IV) with West European (Germany) producers.

2. Sector - regional model

2.1. Approach

Agricultural sector+ subsectors



Agricultural sector

Subsectors + regions + farm-size classes

Region I			Region II
L	Region III	S	Region IV West
	East		
	M		



Subsector: Sheep breeding



Farm-size classes

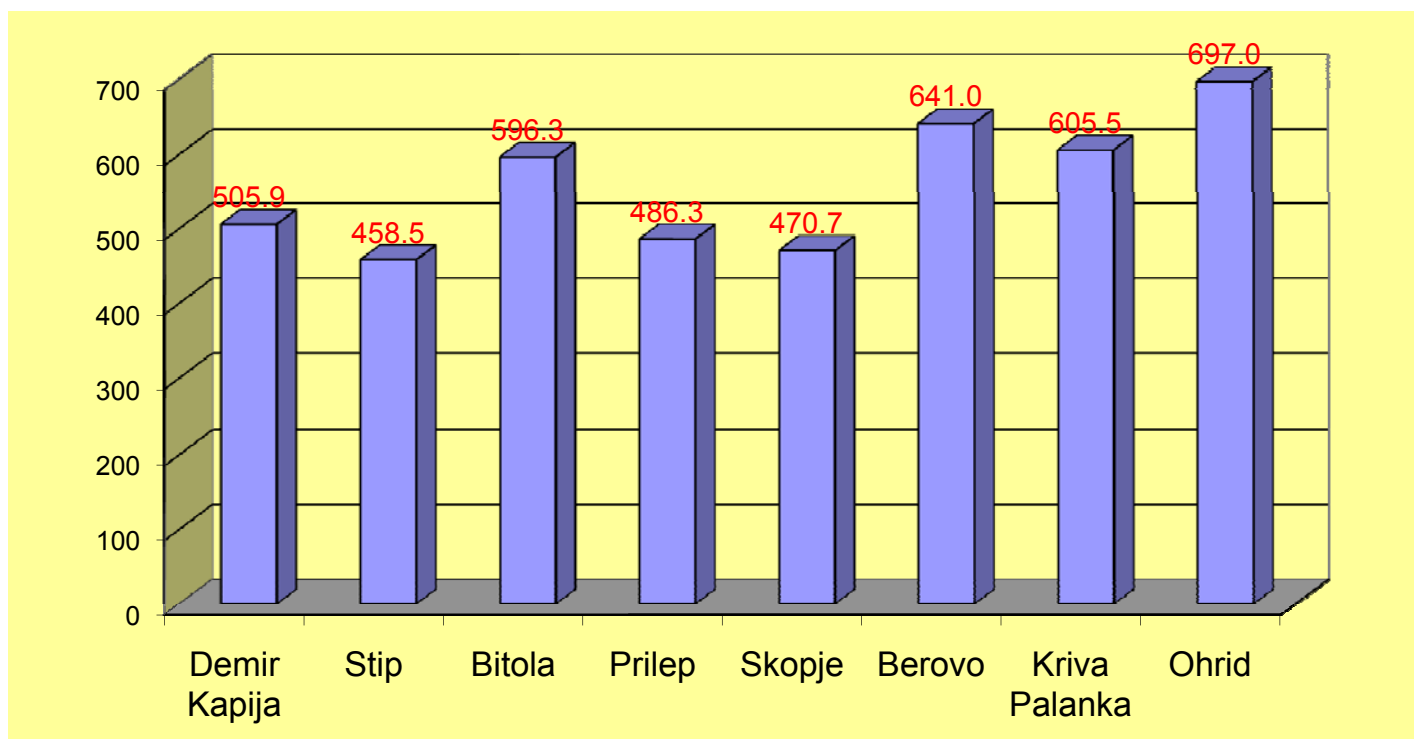
3. Criteria for defining regions

3.2 Sheep breeding

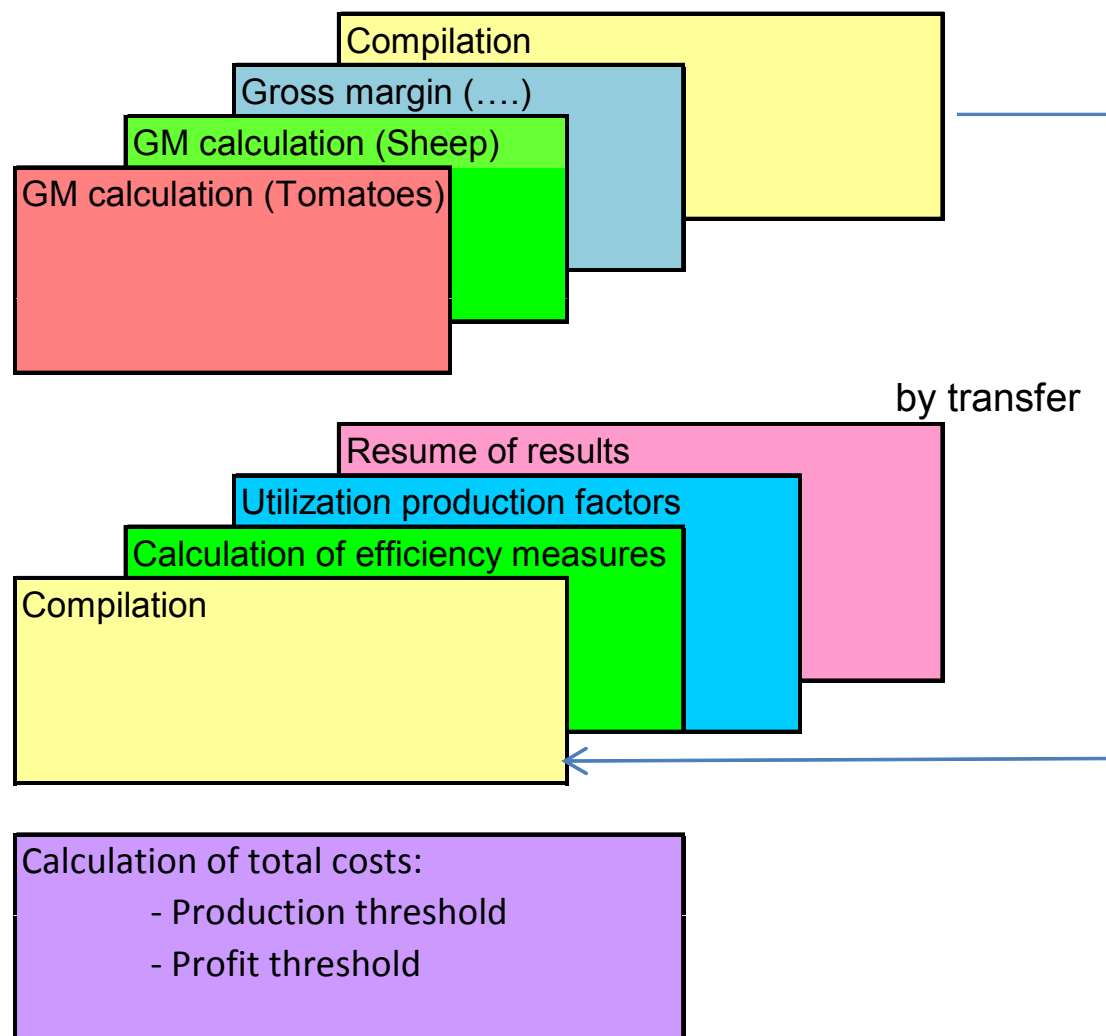


3.2 Sheep breeding

Average annual precipitation in mm (period 1999-2003)



4. Farm Management Information System (FAMIS)



5. Presentation and interpretation of results

5.2 Analysis of sheep breeding

5.2.1 Production structure of typical enterprises



a) East region

Description of typical sheep farm in region III

Region	Region III -East region		
Farm size classes	0-20 ewes	20-60 ewes	> 60 ewes
Farm enterprises:			
-Livestock production-			
Ewes	15	50	110
Sheep-Yearlings	4	10	22
Rams	1	3	5
Cows	1	3	6
-Plant production (in ha)-			
Grazing land	0,20	0,70	1,20
Alfalfa	0,20	0,70	1,20
Wheat	0,16	0,56	1,20
'Rue	0,10	0,35	0,75
Barley	0,08	0,28	0,60
Triticale	0,04	0,14	0,30
Oats	0,02	0,07	0,15
Potatoes	0,15	0,49	0,30
Total (plant production)	0,95	3,29	5,70
Availability of land and labour:			
-Land-			
owned (ha)	1,00	3,00	3,50
rented (ha)		0,50	2,50
-Labour-			
family (hours)	2.000	4.000	4.000
hired (hours)			2.000
Assets:			
(Buildings, machinery)			
Total present costs (€)	60	200	450
Depreciation			
%	10	10	10
Costs (€)	6	20	45
Maintenance			
%	6	6	6
Costs (€)	4	12	27

6) West region

Description of typical sheep farm in region IV

Region	Region IV -West region		
Farm size classes	0-100 ewes	100-250 ewes	> 250 ewes
Farm enterprises:			
-Livestock production-			
Ewes	70	180	350
Sheep-Yearlings	18	45	88
Rams	3	8	14
Cows	1	3	3
-Plant production (in ha)-			
Alfalfa	0,18	0,50	1,00
Wheat	0,23	0,63	1,25
Barley	0,23	0,63	1,25
Mais	0,23	0,63	1,25
Triticale	0,05	0,13	0,25
Total (plant production)	0,90	2,50	5,00
Availability of land and labour:			
-Land-			
owned (ha)	0,90	2,00	4,00
rented (ha)		0,50	1,00
-Labour-			
family (hours)	2.000	4.000	4.000
hired (hours)		1.000	3.000
Assets:			
(Buildings, machinery)			
Total present costs (€)	280	720	1.400
Depreciation			
%	10	10	10
Costs (€)	28	72	140
Maintenance			
%	6	6	6
Costs (€)	17	43	84

5.2.2 Compilation of farm enterprises

a) East region

Farm Enterprises	Gross output	Variable costs	Gross margin	Requir. of work. capital	Yield	Labour requirement
	€ per head or ha	€ per head or ha	€ per head or ha	€ per head or ha	kg per head or ha	hour/head or ha
-Livestock production-						
Ewes, S	110,33	55,25	55,08	90,00	68 kg milk	25,00
Ewes, M	110,33	55,84	54,49	90,00	68 kg milk	25,00
Ewes, L	110,33	52,90	57,43	90,00	68 kg milk	25,00
Sheep-Yearlings, S	88,77	69,76	19,01	76,92		20,00
Sheep-Yearlings, M	88,77	72,70	16,07	79,03		20,00
Sheep-Yearlings, L	88,77	72,11	16,66	78,61		20,00
Rams, S	14,10	50,70	-36,60	90,00		18,00
Rams, M	14,10	54,62	-40,52	90,00		18,00
Rams, L	14,10	53,64	-39,54	90,00		18,00
Cows, milk, S, M	1027,32	1005,90	21,42	1200,00	2500 kg milk	930,00
Cows, meat, L	403,62	235,35	168,27	1200,00	2500 kg milk	744,00
-Plant production (in ha)-						
Grazing land		218,87	-218,87	43,77	1209,60	10,00
Alfalfa		454,10	-454,10	272,46	2500,00	21,00
Wheat	653,59	600,63	52,96	360,38	2000,00	15,00
Rue	653,59	476,52	177,07	285,91	2000,00	13,00
Barley	653,59	544,26	109,34	326,55	2000,00	15,00
Triticale	1143,79	566,69	577,11	340,01	3500,00	16,00
Oats	490,20	544,26	-54,06	326,55	1500,00	15,00
Potatoes	4117,65	2953,92	1163,73	1772,35	18000	250,00

6) *West region*

Farm Enterprises	Gross output	Variable costs	Gross margin	Requir. of work. capital	Yield	Labour requirement
	€ per head or ha	€ per head or ha	€ per head or ha	€ per head or ha	kg per head or ha	hour/head or ha
-Livestock production-						
Ewes, S, M, L	117,07	61,44	55,63	60,00	58 kg mleko	25,00
Sheep-Yearlings, S, M, L	60,88	82,52	-21,64	91,72		20,00
Rams, S, M, L	19,45	94,22	-74,77	90,00		18,00
Cows, milk, S, M, L	1457,23	1106,90	350,33	1200,00	4000 kg mleko	930,00
-Plant production (in ha)-						
Alfalfa		662,67	-662,67	397,60	8600,00	21,00
Wheat	1307,19	578,02	729,17	346,81	4000,00	15,00
Barley	816,99	543,79	273,21	326,27	2500,00	15,00
Mais	1470,59	488,66	981,93	293,19	4500,00	14,00
Triticale	1960,78	515,60	1445,18	309,36	6000,00	15,00

5.2.3 Results – Profit according to farming systems, regions and farm size classes

a)

Farming system: Region:	Livestock (Sheep) III		Livestock (Sheep) III		Livestock (Sheep) III	
Farm size class:	Small (15 Ewes)		Medium (50 Ewes)		Large (110 Ewes)	
Year	2007		2007		2007	
Combination of farm enterprises:	Ewes, S	15	Ewes	50	Ewes	110
	Sheep-Yearlings	4	Sheep-Yearlings	10	Sheep-Yearlings	22
	Rams	1	Rams	3	Rams	5
	Cows, milk	1	Cows, milk	3	Cows, meat	6
	Grazing land	0,20	Grazing land	0,70	Grazing land	1,20
	Alfalfa	0,20	Alfalfa	0,70	Alfalfa	1,20
	Wheat	0,16	Wheat	0,56	Wheat	1,20
	Rue	0,10	Rue	0,35	Rue	0,75
	Barley	0,08	Barley	0,28	Barley	0,60
	Triticale	0,04	Triticale	0,14	Triticale	0,30
	Oats	0,02	Oats	0,07	Oats	0,15
	Potatoes	0,15	Potatoes	0,49	Potatoes	0,30
Efficiency measures:						
Gross output		3.947		12.518		19.900
Variable costs		2.963		9.392		12.436
Gross margin		984		3.126		7.464
Value added		786		2.467		6.015
Net farm income		786		2.467		4.015
Profit		786		2.426		3.810
from farm enterprises						
Direct Payments (Goverm.)		74		239		523
Profit incl. other farm income		860		2.665		4.333
Total production of major livestock products:						
Sheep products:						
Lamb (kg)		277		918		2.020
Mutton (kg)		92		302		641
Sheep milk (kg)		1.020		3.400		7.480
Cow products:						
Cow beef (kg)		39		118		263
Cow milk (kg)		2.500		7.500		1.024
Total demand of important inputs:						
Concentrates (kg)		1.425		4.500		9.900
Hay purchased (kg)				1.800		3.168

5.2.3 Results – Profit according farming systems, regions and farm size classes

6)

Farming system: Region:	Livestock (Sheep) IV		Livestock (Sheep) IV		Livestock (Sheep) IV	
Farm size class:	Small (70 Ewes)		Medium (180 Ewes)		Large (350 Ewes)	
Year	2007		2007		2007	
Combination of farm enterprises:	Ewes	70	Ewes	180	Ewes	350
	Sheep-Yearlings	18	Sheep-Yearlings	45	Sheep-Yearlings	88
	Rams	3	Rams	8	Rams	14
	Cows, milk	1	Cows, milk	3	Cows, milk	3
	Alfalfa	0,18	Alfalfa	0,50	Alfalfa	1,00
	Wheat	0,23	Wheat	0,63	Wheat	1,25
	Barley	0,23	Barley	0,63	Barley	1,25
	Mais	0,23	Mais	0,63	Mais	1,25
	Triticale	0,05	Triticale	0,13	Triticale	0,25
Efficiency measures:						
Gross output	11.703		30.831		55.958	
Variable costs	7.680		20.249		36.209	
Gross margin	4.023		10.582		19.749	
Value added	3.101		8.211		15.138	
Net farm income	3.101		7.211		12.138	
Profit	3.101		7.170		12.056	
from farm enterprises						
Direct Payments (Govern.)	349		849		1.737	
Profit	3.450		8.019		13.793	
incl. other farm income						
Total production of major livestock products:						
Sheep products:						
Lamb (kg)	1.273		3.273		6.365	
Mutton (kg)	529		1.365		2.623	
Sheep milk (kg)	4.060		10.440		20.300	
Cow products:						
Cow beef (kg)	39		118		118	
Cow milk (kg)	4.000		12.000		12.000	
Total demand of important inputs:						
Concentrates (kg)	8.190		21.000		40.640	
Hay purchased (kg)	9.124		23.394		45.272	

5.3 Comparison of the competitiveness of selected products

5.3.2 Sheep breeding, Meat production– Production Threshold and Profit Threshold

	Macedonia		Germany
Region:	East region III	West region IV	Milk yield 75
Farm size class:	L, M, S	L, M, S	
Average yield; kg/dekar	18	19	31
Price per kg in €	2,21 €	2,21 €	4,00 €
Variable costs	62	63	72
- Value of other products (non-meat-produce)	70	76	58
+ Imputed costs for current assets	4	2	6
= <i>Variable costs I</i>	-5	-10	20
Production Threshold I per kg	- 0,26 €	- 0,52 €	0,64 €
+ Labour costs	25	25	89
= <i>Variable costs II</i>	21	15	109
Production Threshold II per kg	1,14 €	0,82 €	3,54 €
+ Land (opportunity costs)	2	0	6
= <i>Variable costs III</i>	22	16	115
Production Threshold III per kg	1,23 €	0,83 €	3,73 €
+Equipment, Depreciation, Insurance	1	1	6
+ Buildings, Depreciation and Maintenance	5	5	20
+ Imputed costs for fixed assets	1	1	9
+ Other fixed costs	2	2	2
= <i>Total costs</i>	32	26	153
Profit Threshold per kg meat	1,80 €	1,37 €	4,98 €

Realized Profit and Net farm income

Profit:

Berovo - 0,41 €/kg. or 7 €/head

Gostivar - 0,84 €/kg. or 15 €/head

Net farm income :

Berovo - 0,98 €/kg. or 18 €/head

Gostivar - 1,38 €/kg. or 26 €/head

Efficiency indicators for production of:

Sheep RIV Meat L 1 Ewe

Main yield: Quantity: 19 kg M. Price: 2,210 € per kg M.			Costs	GM / Profit	Return to production factors			Minimum price	
					Capital (€)	Labour (h)	Land	Long term	Short term
Main yield (Quantity × Price)			€ : 41	+ 41,37	+ 41,37	+ 41,37	+ 41,37		
Other yields (also premium)			€ : 76	+ 75,50	+ 75,50	+ 75,50	+ 75,50	– 75,50	– 75,50
Variable costs (from GM)			€ : 63	+ 63,29	– 63,29	– 63,29	– 63,29	+ 63,29	+ 63,29
Gross Margin			= 63,29	= 53,58					
Imputed costs for current asse			61 € × 4,0%	+ 2,44		– 2,44	– 2,44	+ 2,44	+ 2,44 per kg M.
Production Threshold I			= 65,74	= 51,13				= -9,76 => -0,521	
Labour costs :			25,05 h × 1,00	+ 25,05	– 25,05		– 25,05	+ 25,05	+ 25,05 per kg M.
Production Threshold II			= 90,79	= 26,09				= 15,29 => 0,817	
Land costs:			0,003 ha × 82	+ 0,23	– 0,23	– 0,23		+ 0,23	+ 0,23
Other costs			+	+	–	–	–	+	+
Production Threshold III			= 91,02	= 25,86				= 15,52 => 0,829	
Short term			Factor payment		= 28,30	= 50,90	= 26,09		
return to production factors			Factor input		: 61,11	: 25,05	: 0,003		
			Factor payment		= 46,3%	= 2,03	= 9.316,28		
Depreciation equipment			10 € × 10,00%	+ 1,00	– 1,00	– 1,00	– 1,00	+ 1,00	
Depreciation buildings			50 € × 10,00%	+ 5,00	– 5,00	– 5,00	– 5,00	+ 5,00	
Imputed costs for fixed assets			30 € × 4,0%	+ 1,20	– 1,20		– 1,20	+ 1,20	
Needs of labour for general wo			1 h × 1,00	+ 1,00	– 1,00	– 1,00	– 1,00	+ 1,00	
Maintenance, insurance, etc.			€ :	+	–	–	–	+	
Other fixed and general costs			€ : 2,00	+ 2,00	– 2,00	– 2,00	– 2,00	+ 2,00	
Profit Threshold			= 101,22	= 15,66				= 25,72 => 1,374	per kg M.
Long term			Factor payment		= 19,30	= 41,70	= 15,89		
return to production factors			Factor input		: 91,11	: 26,05	: 0,003		
			Factor payment		= 21,18%	= 1,60	= 5.673,43		

Efficiency indicators for production of: Sheep Germany 75Milk yield

Main yield: Quantity: 31 kg M. Price: 4,000 € pe kg M.			Costs	GM / Profit	Return to production factors			Minimum price	
					Capital (€)	Labour (h)	Land	Long term	Short term
Main yield (Quantity × Price)				+ 122,88	+ 122,88	+ 122,88	+ 122,88		
Other yields (also premium)				+ 57,60	+ 57,60	+ 57,60	+ 57,60	– 57,60	– 57,60
Variable costs (from GM)			+ 71,53	– 71,53	– 71,53	– 71,53	– 71,53	+ 71,53	+ 71,53
Gross Margin			= 71,53	= 108,95					
Imputed costs for current asse 113 € × 5,0%			+ 5,65	– 5,65		– 5,65	– 5,65	+ 5,65	+ 5,65 per kg M.
Production Threshold I			= 77,18	= 103,30				= 19,58 => 0,638	
Labour costs : 8,91 h × 10,00			+ 89,15	– 89,15	– 89,15		– 89,15	+ 89,15	+ 89,15 per kg M.
Production Threshold II			= 166,33	= 14,15				= 108,73 => 3,539	
Land costs: 0,085 ha × 70			+ 5,96	– 5,96	– 5,96	– 5,96		+ 5,96	+ 5,96
Other costs			+	–	–	–		+	per kg M.
Production Threshold III			= 172,29	= 8,19				= 114,69 => 3,734	
Short term			Factor payment		= 13,84	= 97,33	= 14,15		
return to production factors			Factor input		: 113,07	: 8,91	: 0,085		
			Factor payment		= 12,2%	= 10,92	= 166,10		
Depriciation equipment 64 € × 10,00%			+ 6,40	– 6,40	– 6,40	– 6,40	– 6,40	+ 6,40	
Depriciation buildings 287 € × 7,00%			+ 20,11	– 20,11	– 20,11	– 20,11	– 20,11	+ 20,11	
Imputed costs for fixed assets 176 € × 5,0%			+ 8,78	– 8,78		– 8,78	– 8,78	+ 8,78	
Needs of labour for general wc 1 h × 1,00			+ 1,00	– 1,00	– 1,00		– 1,00	+ 1,00	
Maintenance, insurance, etc. € :			+	–	–	–	–	+	
Other fixed and general costs € : 2,00			+ 2,00	– 2,00	– 2,00	– 2,00	– 2,00	+ 2,00	
Profit Threshold			= 210,58	= -30,10				= 152,98 => 4,980	per kg M.
Long term			Factor payment		= -15,67	= 60,05	= -24,14		
return to production factors			Factor input		: 288,68	: 9,91	: 0,085		
			Factor payment		= -5,43%	= 6,06	= -283,34		

Recommendations:



MAFP Project
EU Approximation and Regional Cooperation
in the Agro & Food Sector

Production of lamb meat – Economically

- For export, the competition (Bulgaria and Romania) is to be taken into consideration

Maintenance and increase of the market share of Macedonia with provision of higher level of competitiveness of the Macedonian lamb meat

- Decrease in production costs

* Optimization of feeding, improvement of breeds and management of selection and fertility by ewes

Data from the analysis are necessary and important for creation of the agricultural policy for future strategy for support of the animal breeding sector!!!