

Effects of yield variation and lambing period on the profitability of certain sheep breeds in Greece

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1. Introduction

Independently from the sheep breed, the basic factors affecting the profitability of a ewe are, on the one hand, the exploitable milk yield and the number of weaned lambs combined with their prices and, on the other hand, the cost of ration for producing milk and the labour wages for milking. This is true taking into account that the annual expenses of fixed capital (livestock, buildings, machinery, etc.), the cost of maintenance ration and the labour wages for daily work in the stable are always the same irrespective of the yield achieved. In previous papers, we analysed data from certain sheep breeds based on the average exploitable milk yield and number of weaned lambs ignoring the variation which is connected to the average yield.

In this paper, we study the effects on the yield variation on the one hand and on the period of lambing of a ewe on its profitability on the other hand for sheep breeds such as Frisarta (Northwest Greece), Karagouniki (Central Greece) and Sfakia (Crete Island). The investigation refers to these sheep breeds because the Centres of Genetic Improvement of Animals of our country

Abstract

This paper presents the effects of the yield variation and of a ewe's lambing period on the profitability of three sheep breeds (Frisarta, Karagouniki and Sfakia) reared in Greece. The analysis based on the yield variation of a ewe showed significant effect on its profitability independently from the sheep breed considered. Specifically, as for the Frisarta breed, the profit is greatly affected, from -9.1 to 91.7 €/ewe according to the milk yield. The same is true for the Karagouniki breed and for the Sfakia breed. Analogous is the effect of the yield variation on the farm income and on the return on capital. The analysis based on the lambing period of a ewe also showed a significant effect on its profitability independently from the sheep breed. Specifically, as for the Frisarta breed, the profit is greatly affected, from -7.1 to 91.4 €/ewe according to the lambing period. The same is true for the Karagouniki breed and the Sfakia breed. Analogous is the effect of the lambing period on the farm income and on the return on capital. From the above-mentioned considerations, it is concluded that it is possible to significantly improve the cost of production on the one hand and the farm income and profit on the other hand. This improvement can be achieved by continuing the selection of the most productive ewes with the smallest yield variation, by creating better management conditions and by increasing the number of early lambings.

Key words: sheep rearing, profitability, farm income.

Résumé

Cet article présente les effets de la variation du rendement et de la période d'agnelage sur la rentabilité de trois espèces ovines (Frisarta, Karagouniki et Sfakia) élevées en Grèce. L'analyse se base sur la démonstration du fait que la variation du rendement d'une brebis a des répercussions importantes sur sa rentabilité indépendamment de la race ovine considérée. En particulier, en ce qui concerne la race Frisarta, le profit est fortement affecté, entre -9,1 et 91,7 €/brebis, d'après le rendement laitier. Il en va de même pour les races Karagouniki et Sfakia. Analogue est l'effet de la variation du rendement sur le revenu de l'élevage et sur la rémunération du capital. Cette analyse montre aussi que même la période d'agnelage a des répercussions importantes sur la rentabilité de l'animal indépendamment de la race ovine considérée. En particulier, en ce qui concerne la race Frisarta, le profit est fortement affecté, entre -7,1 et 91,4 €/brebis, d'après la période d'agnelage. Il en va de même pour les races Karagouniki et Sfakia. Analogue est l'effet de la période d'agnelage sur le revenu de l'élevage et sur la rémunération du capital. Selon les indications susmentionnées, il est possible de conclure que les coûts de production, le revenu et le profit d'un élevage peuvent être sensiblement améliorés en procédant à la sélection des brebis les plus productives présentant la plus petite variation du rendement. Tout cela sera possible grâce à une meilleure gestion de l'élevage et à l'augmentation du nombre des agnelages précoces.

Mots-clés: élevage de brebis, rendement, revenue net.

have the necessary physical data, e.g. the average exploitable milk yield and the average number of lambs weaned by a ewe and their variation according to each lactation and to each period of lambing. Additionally, data on milk and lambs prices achieved were taken from the Ministry of Agriculture for each region during the year, while the technical and economic data on the labour used, feed provided, annual expenses of fixed capital (livestock, buildings, machinery, etc.), and on veterinary fees were taken from recently undertaken investigations carried out on these sheep breeds.

The effect of the yield variation and of the lambing period on the farm return, production costs and income is presented both separately for each sheep breed and comparatively.

2. Average exploitable milk yield and number of weaned lambs per ewe per year and their variation according to each lactation

The average milk yield of a ewe of the Frisarta breed fluctuates from lactation to lactation between 31 and 80 kg, while for the total of lactations its fluctuation is 57 kg. On the other hand, the fluctuation of the average number of lambs weaned by a ewe according to each lactation and to the total

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of lactations is equal to 0.19. The average milk yield of a ewe of the Karagouniki breed fluctuates according to each lactation between 23 and 42 kg, while for the total of lactations its fluctuation is 35 kg. On the other hand, the average number of lambs weaned by a ewe fluctuates according to each lactation between 0.15 and 0.21, while for the total of lactations its fluctuation is 0.18. The average milk yield of a ewe of the Sfakia breed fluctuates according to each lactation between 29 and 35 kg, while for the total of lactations its fluctuation is 31 kg. On the other hand, the average number of lambs weaned by a ewe fluctuates according to each lactation between 0.005 and 0.015, while for the total of lactations its fluctuation is 0.010 (table 1).

Table 1 – Average exploitable milk yield and number of lambs weaned per ewe per year and their variation according to each lactation for three sheep breeds reared in Greece.

Sheep breeds and lactations	Exploitable milk yield per ewe in kg			Number of lambs weaned per ewe		
	$\bar{X} +1s$	\bar{X}	$\bar{X} -1s$	$\bar{X} +1s$	\bar{X}	$\bar{X} -1s$
I. Frisarta breed						
Lactation 1	237	206	175	1.57	1.38	1.19
" 2	295	233	171	1.83	1.64	1.45
" 3	334	262	190	1.86	1.67	1.48
" 4	360	280	200	1.88	1.69	1.50
" 5	317	257	197	1.91	1.72	1.53
" 6	281	244	207	1.85	1.66	1.47
Average of 6 lactations	304	247	190	1.814	1.624	1.434
2. Karagouniki breed						
Lactation 1	165	142	119	1.33	1.18	1.03
" 2	196	165	134	1.48	1.31	1.14
" 3	219	182	144	1.51	1.34	1.17
" 4	238	196	154	1.60	1.41	1.22
" 5	232	192	151	1.81	1.60	1.39
" 6	222	185	147	1.60	1.41	1.22
Average of 6 lactations	212	177	142	1.555	1.375	1.195
3. Sfakia breed						
Lactation 1	145	116	87	1.34	1.33	1.32
" 2	159	127	95	1.37	1.36	1.35
" 3	170	139	108	1.39	1.38	1.36
" 4	167	136	105	1.38	1.37	1.36
" 5	160	129	98	1.36	1.35	1.34
" 6	160	127	94	1.35	1.35	1.34
Average of 6 lactations	160	129	98	1.365	1.355	1.345

3. Average returns, costs and incomes per ewe per year and their variation

The variation of the average gross return of the total of lactations of a ewe per year of the Frisarta breed is greater (± 61.6 €/ewe) than the variation of total expenses (± 11.2 €/ewe) because the annual expenses of livestock, buildings and machinery remain the same according to the gross return. The same is true for the maintenance ration and for the every day care for animals. The small increase in the total expenses according to the yield leads to the great decrease in the cost of production (from 0.927 to 0.654 €/kg of milk and from 3,291 to 2,600 €/kg of weaned lambs) and to the great increase in the profit (from -9.1 to 91.7 €/ewe), in the farm income (from 71.4 to 179.1 €/ewe) and in the return on capital (from 8.9 to 36.2%) (table 2).

The variation of the average gross return of the total of lactations of a ewe per year of the Karagouniki breed is

Table 2 – Average returns, costs and incomes per ewe per year and their variation for the total lactations of three sheep breeds reared in Greece.

Kinds of economic results of certain sheep breeds	Returns, costs and incomes in euro		
	$\bar{X} +1s$	\bar{X}	$\bar{X} -1s$
I. Frisarta breed			
1. Gross return (€/ewe)	365.8	304.2	242.6
2. Total expenses (€)	274.1	262.9	252.7
3. Cost of production			
a) Milk (€/kg)	0.654	0.772	0.927
b) L.W. of lamb (€)	2,600	2,783	3,291
4. Profit or loss (€/ewe)	91.7	41.3	-9.1
5. Farm income (€)	179.1	125.3	71.4
6. Return on capital (%)	36.2	22.7	8.9
II. Karagouniki breed			
1. Gross return (€/ewe)	262.2	222.4	182.6
2. Total expenses (€)	193.6	184.0	174.4
3. Cost of production			
a) Milk (€/kg)	0.662	0.728	0.799
b) L.W. of lamb (€)	2,535	2,974	3,776
4. Profit or loss (€/ewe)	68.6	38.4	8.2
5. Farm income (€)	138.6	105.5	72.4
6. Return on capital (%)	36.6	25.7	11.6
III. Sfakia breed			
1. Gross return (€/ewe)	190.5	162.5	134.5
2. Total expenses (€)	168.9	153.7	138.5
3. Cost of production			
a) Milk (€/kg)	0.740	0.774	0.848
b) L.W. of lamb (€)	2,799	2,989	3,095
4. Profit or loss (€/ewe)	21.6	8.8	-4.0
5. Farm income (€)	73.2	61.0	42.7
6. Return on capital (%)	23.2	16.7	9.8

greater (± 39.8 €/ewe) than the variation of the total expenses (± 9.6 €/ewe) for the same above-mentioned reasons. The small increase in the total expenses according to the yield leads to the great decrease in the cost of production (from 0.799 to 0.622 €/kg of milk and from 3,776 to 2,535 €/kg of lambs weaned) and to the great increase in the profit (from 8.2 to 68.6 €/ewe), in the farm income (from 72.4 to 138.6 €/ewe) and in the return on capital (from 11.6 to 36.6%).

The variation of the average gross return of the total of lactations of a ewe per year of the Sfakia breed is greater (± 56.0 €/ewe) than the variation of the total expenses (± 30.4 €/ewe) for the same above-mentioned reasons. The small increase in the total expenses according to the yield leads to the great decrease in the cost of production (from 0.848 to 0.740 €/kg of milk and from 3,095 to 2,799 €/kg of lambs weaned) and to the great increase in the profit (from -4.0 to 21.6 €/ewe), in the farm income (from 42.7 to 73.2 €/ewe) and in the return on capital (from 9.8 to 23.2%).

4. Average exploitable milk yield and number of lambs weaned per ewe per year and their variation according to the lambing period

The variation of the average milk yield per ewe per year of the Frisarta, Karagouniki and Sfakia breeds for each lambing period is 55 kg, 35 kg and 16 kg respectively, which is considered to be important for improving the farm

income independently from the lambing period. However, this paper gives special emphasis to the comparison between the average milk yields and the number of weaned lambs in the three lambing periods of each sheep breed.

For the Frisarta breed, the average milk yield per ewe per year of the first lambing period (1/9 to 15/11) is 288 kg, namely 22.6% greater than the average milk yield per ewe per year (235 kg) of the second lambing period (16/11 to 31/1) and 31.6% greater than the average milk yield per ewe per year (197 kg) of the third lambing period (1/2 to 30/4). On the other hand, the participation of the ewes in each lambing period with respect to their total number in a flock is 24.1% for the first period, 55.1% for the second period and 20.8% for the third period. Also, the average number of lambs weaned per ewe per year in the first lambing period is 1,833, namely 17.0% higher than the average number of lambs weaned per ewe per year in the second lambing period (1,567) and 36.9% greater than the average number of lambs weaned per ewe per year in the third lambing period (1,339) (table 3).

Table 3 – Average exploitable milk yield and number of lambs weaned per ewe per year and their variation according to lambing period for three sheep breeds reared in Greece.

Sheep breeds and lambing periods	Exploitable milk yield per ewe in kg			Number of lambs weaned per ewe		
	$\bar{X} + 1s$	\bar{X}	$\bar{X} - 1s$	$\bar{X} + 1s$	\bar{X}	$\bar{X} - 1s$
1. Frisarta breed						
1 st period (1/9-15/11)	344	288	232	2,033	1,833	1,633
2 nd period (16/11-31/1)	290	235	180	1,767	1,567	1,367
3 rd period (1/2-30/4)	252	197	142	1,539	1,339	1,139
2. Karagouniki breed						
1 st period (1/9-15/11)	257	221	185	1,745	1,565	1,385
2 nd period (16/11-31/1)	207	174	141	1,515	1,335	1,155
3 rd period (1/2-30/4)	172	136	100	1,405	1,225	1,045
3. Sfakia breed						
1 st period (1/9-15/11)	164	149	134	1,754	1,586	1,418
2 nd period (16/11-31/1)	136	121	106	1,432	1,284	1,136
3 rd period (1/2-30/4)	93	76	59	1,202	1,077	0,952

For the Karagouniki breed, the average milk yield per ewe per year in the first lambing period is 221 kg, namely 27.0% greater than the average milk yield per ewe per year (174 kg) in the second lambing period and 38.5% greater than the average milk yield per ewe per year (136 kg) in the third lambing period. On the other hand, the participation of the ewes in each period of lambing with respect to their total number in a flock is 7.7% in the first period, 72.3% in the second period and 20.0% in the third period. Also, the average number of lambs weaned per ewe per year in the first lambing period is 1,565, namely 17.2% greater than the average number of lambs weaned per ewe per year in the second lambing period (1,335) and 27.8% greater than the average number of lambs weaned per ewe per year in the third lambing period (1,225).

For the Sfakia breed, the average milk yield per ewe per year in the first lambing period is 149 kg, namely 23.1% greater than the average milk yield per ewe per year (121 kg) in the second lambing period and 96.0% greater than the average milk yield per ewe per year (76 kg) in the third

lambing period. On the other hand, the participation of the ewes in each lambing period with respect to their total number in a flock is 23.6% in the first period, 75.6% in the second period and 0.8% in the third period. Also, the average number of lambs weaned per ewe per year in the first lambing period is 1,586, namely 23.5% greater than the average number of lambs weaned per ewe per year in the second lambing period (1,284) and 47.3% greater than the average number of lambs weaned per ewe per year in the third lambing period (1,077).

5. Average returns, costs and incomes per ewe per year according to lambing period

The average gross return per year of the Frisarta ewes of the first lambing period is 361.4 €/ewe, 26.3% greater than the corresponding gross return of the second lambing period (286.1 €/ewe) and 47.3% greater than the gross return of the third lambing period (245.4 €/ewe). Taking into account that the total expenses increase very little compared with the gross return, e.g. 3.3% between the second and first lambing period and 3.7% between the third and first lambing period, it is concluded that the ewes of the first lambing period achieve a higher profit (91.4 €/ewe) than the ewes of the second lambing period (25.3 €/ewe) and a much higher profit than the ewes of the third lambing period (-7.1 €/ewe). The great difference in profit between the ewes of the first and those of the second lambing period contributes to the increase in the farm income, e.g. 62.9% (from 108.9 to 177.4 €/ewe). The farm income increases even more, e.g. 140.4% (from 73.8 to 177.4 €/ewe) once we consider the much greater difference in profit between the ewes of the first and those of the third lambing period. The same is true for the return on capital (36.2% for the first period, 18.4% for the second period and 9.5% for the third period). This is verified by considering the fact that 24.1% of the total number of ewes participating in the first lambing period and 36.2% of them contribute to the farm income achieved instead of 55.1% and 50.8% respectively for the ewes of the second lambing period and 20.8% and 13.0% respectively for the ewes of the third lambing period (table 4).

Table 4 – Average returns, costs and incomes per ewe per year according to period of lambing for three breeds rearing in Greece.

Sheep breeds and lambing periods	Exploitable milk yield per ewe in kg			Number of lambs weaned per ewe		
	$\bar{X} + 1s$	\bar{X}	$\bar{X} - 1s$	$\bar{X} + 1s$	\bar{X}	$\bar{X} - 1s$
1. Frisarta breed						
1 st period (1/9-15/11)	344	288	232	2,033	1,833	1,633
2 nd period (16/11-31/1)	290	235	180	1,767	1,567	1,367
3 rd period (1/2-30/4)	252	197	142	1,539	1,339	1,139
2. Karagouniki breed						
1 st period (1/9-15/11)	257	221	185	1,745	1,565	1,385
2 nd period (16/11-31/1)	207	174	141	1,515	1,335	1,155
3 rd period (1/2-30/4)	172	136	100	1,405	1,225	1,045
3. Sfakia breed						
1 st period (1/9-15/11)	164	149	134	1,754	1,586	1,418
2 nd period (16/11-31/1)	136	121	106	1,432	1,284	1,136
3 rd period (1/2-30/4)	93	76	59	1,202	1,077	0,952

The average gross return per year of the Karagouniki ewes of the first lambing period is 272.0 €/ewe, namely 32.9% greater than the gross return of the second lambing period (204.6 €/ewe) and 53.3% greater than the gross return of the third lambing period (177.4 €/ewe). Taking into account that the total expenses increase very little compared with gross return, e.g. 6.0% between the second and first lambing period and 13.6% between the third and first lambing period, it is concluded that the ewes of the first lambing period achieve a higher profit (75.7 €/ewe) than the ewes of the second lambing period of (21.4 €/ewe) and a much higher profit than the ewes of the third lambing period (4.6 €/ewe). The great difference in profit between the ewes of the first and those of the second lambing period contributes to the increase in the farm income, e.g. 65.8% (from 88.3 to 146.4 €/ewe). The farm income increases even more, e.g. 114.0% (from 68.4 to 146.4 €/ewe), once we consider the greater difference in profit between the ewes of the first and those of the third lambing period. The same is true for the return on capital (38.7% for the first period, 19.5% for the second period and 13.3% for the third period). This is verified by taking into account that 7.7% of the ewes of the first lambing period participate and 12.7% of them contribute to the farm income achieved instead of 72.3% and 71.9% respectively for the ewes of the second lambing period and 20.0% and 15.4% respectively of the ewes of the third lambing period (table 5).

Table 5 – Ewes participating in each lambing period and their contribution to the total farm income.

Participation and contribution of ewes of each lambing period	Lambing periods		
	1/9-15/11	16/11-31/1	1/2-30/4
A. Frisarta breed			
1. Participation in each lambing period (%)	24.1	55.1	20.8
2. Contribution to the total farm income (%)	36.2	50.8	13.0
B. Karagouniki breed			
1. Participation in each lambing period (%)	7.7	72.3	20.0
2. Contribution to the total farm income (%)	12.7	71.9	15.4
C. Sfakia breed			
1. Participation in each lambing period (%)	23.6	75.6	0.8
2. Contribution to the total farm income (%)	31.5	68.1	0.4

The average gross return per year of the Sfakia breed ewes of the first lambing period is 188.4 €/ewe, namely 24.4% greater than the gross return of the second lambing period (151.5 €/ewe) and 77.1% greater than the gross return of the third lambing period (106.4 €/ewe). Taking into account that the total expenses increase very little compared with the gross return, e.g. 11.7% between the second and first lambing period and 27.3% between the third and first lambing period, it is concluded that the ewes of the first lambing period achieve a very high profit (25.0 €/ewe) in relation to ewes of the second lambing period (1.5 €/ewe) and a much higher profit in relation to ewes of the third lambing period (-22.0 €/ewe). The great difference in profit between the ewes of the first and those of the second lambing period contributes to the increase in the farm income, e.g. 48.3% (from 53.0 to 78.6 €/ewe). The farm income in-

creases even more, e.g. 231.6%, once we consider the much greater difference in profit (from 23.7 to 78.6 €/ewe) between the ewes of the first and those of the third lambing period. The same is true for the return on capital (25.1% for the first period, 12.8% for the second period and -0.5% for the third period). This is verified if we take into account that 23.6% of the ewes of the first lambing period and 31.5% of them contribute to the farm income achieved instead of 75.6% and 68.1% respectively for the ewes of the second lambing period and 0.8% and 0.4% respectively for the ewes of the third lambing period.

6. Comparison of a ewe profitability between the three sheep breeds according to yield variation and to the lambing period

The comparison of a ewe profitability between the three sheep breeds according to yield variation and the lambing period is restricted to the farm profit and income only, because these are considered to be the most representative kinds of the purely economic results.

According to yield variation, the profit achieved by the Frisarta ewes on the average yield (41.3 €/ewe) does not greatly differ from the corresponding average yield of the Karagouniki breed (38.4 €/ewe), while the profit of the Sfakia breed is much smaller (8.8 €/ewe). This difference in profit among the three sheep breeds becomes greater (91.7 €/ewe, 68.6 €/ewe and 21.6 €/ewe respectively) when their highest yields are compared, because the gross return increases more rapidly in relation to the total expenses. On the contrary, the rearing the Frisarta and Sfakia ewes is unprofitable (-9.1 €/ewe and -4.0 €/ewe) when smaller yields are achieved, while the rearing of the Karagouniki ewes is still profitable (8.2 €/ewe) (table 6).

Table 6 – Average farm profit and income per ewe per year, their variability and comparison between the three sheep breeds reared in Greece.

Farm Profit and Income deriving from the three sheep breeds	Number of lambs weaned per ewe		
	X +1s	X	X -1s
I. Farm Profit (€/ewe)			
1. Frisarta breed	91.7	41.3	-9.1
2. Karagouniki breed	68.6	38.4	8.2
3. Sfakia breed	21.6	8.8	-4.0
II. Farm income (€/ewe)			
1. Frisarta breed	179.1	125.3	71.4
2. Karagouniki breed	138.6	105.5	72.4
3. Sfakia breed	73.2	61.0	42.7

The farm income achieved by the Frisarta ewes on the average yield (125.3 €/ewe) significantly differs from the farm income of the Karagouniki breed (105.5 €/ewe) in relation to profit because the ewes of the first breed have increased labour requirements and higher interest of fixed capital (livestock, building and machinery). This difference is greater between ewes of Frisarta and Sfakia breeds (125.3 €/ewe and 61.0 €/ewe respectively). The difference in farm income between the three sheep breeds becomes

much greater when their highest yields are compared (179.1 €/ewe, 138.6 €/ewe and 73.2 €/ewe respectively). On the contrary, the farm income of the Frisarta and the Karagouniki breeds is nearly the same (71.4 €/ewe and 72.4 €/ewe respectively) when their lowest yields are compared, because the greater profit of the Karagouniki ewes is equalized by the greater wages of labour and interest of capital of the Frisarta ewes, while the farm income of the Sfakia breed is much lower (42.7 €/ewe).

According to lambing period, the profit achieved by the Frisarta ewes in the first lambing period is greater (91.4 €/ewe) than the corresponding profit of the Karagouniki breed (75.7 €/ewe) and much higher than the profit of the Sfakia breed (25.0 €/ewe). This difference becomes smaller during the second lambing period (25.3 €/ewe, 21.4 €/ewe and 1.5 €/ewe respectively) because the gross return decreases faster than the total expenses. On the contrary, the rearing of the Frisarta and Sfakia ewes in the third lambing period is unprofitable (-7.1 €/ewe and -22.0 €/ewe respectively), while the rearing of the Karagouniki ewes is still profitable (4.6 €/ewe) (table 7).

Table 7 – Average farm profit and income for the total lactations of a ewe in all lambing periods and comparison between the three sheep breeds.

Farm Profit and Income deriving from the three sheep breeds	Average farm profit and income according to lambing period		
	1 st period	2 nd period	3 rd period
I. Farm Profit (€/ewe)			
1. Frisarta breed	91.4	25.3	-7.1
2. Karagouniki breed	75.7	21.4	4.6
3. Sfakia breed	25.0	1.5	-22.0
II. Farm income (€/ewe)			
1. Frisarta breed	177.4	108.9	73.8
2. Karagouniki breed	146.4	88.3	68.4
3. Sfakia breed	78.6	53.0	23.7

The farm income deriving from by the Frisarta ewes in the first lambing period is greater (177.4 €/ewe) than the farm income of the Karagouniki breed (146.4 €/ewe) and much higher than the farm income of the Sfakia breed (78.6 €/ewe). This difference becomes smaller during the second lambing period (108.9 €/ewe, 88.3 €/ewe and 53.0 €/ewe respectively) because the gross return decreases faster than the total expenses. The same is true for the farm income of the third lambing period of the Frisarta and Karagouniki

ewes (73.8 €/ewe and 68.4 €/ewe respectively) with the exception of the farm income of the Sfakia breed (23.7 €/ewe) which decreases more rapidly.

Conclusions

In this paper, we study the effect of the yield variation and of the lambing period of a ewe on its profitability by considering three sheep breeds reared in Greece. The technical and economic analysis of available data showed that the variation in the yield affects the farm profit, income and return on capital independently from the sheep breed because the gross return increases or decreases faster than the total expenses. Also, the technical and economic analysis of the available data showed that the lambing period affects the farm profit, income and return on capital irrespective of the sheep breed because the ewes of the first lambing period achieve higher gross return in relation to total expenses compared with the gross returns of the ewes of the second and much more of the third lambing period. It is concluded that there is significant room for improving the cost of production on the one hand and the farm profit and income on the other hand. This can be achieved by continuing the selection of the most productive ewes with the smallest yield variation, by creating better management conditions and by increasing the number of the first lambing periods.

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