Mountainous grasslands sustaining traditional livestock systems: The economic performance of sheep and goat transhumance in Greece

Ragkos A., Siasiou A., Galanopoulos K., Lagka V.

in

Baumont R. (ed.), Carrère P. (ed.), Jouven M. (ed.), Lombardi G. (ed.), López-Francos A. (ed.), Martin B. (ed.), Peeters A. (ed.), Porqueddu C. (ed.).
Forage resources and ecosystem services provided by Mountain and Mediterranean grasslands and rangelands

Zaragoza : CIHEAM / INRA / FAO / VetAgro Sup Clermont-Ferrand / Montpellier SupAgro
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 109

2014
pages 575-579

Mountainous grasslands sustaining traditional livestock systems: The economic performance of sheep and goat transhumance in Greece

A. Ragkos[1,*], A. Siasiou[2], K. Galanopoulos[2] and V. Lagka[1]

[1]Department of Agricultural Technology, Alexander Technological Educational Institute of Thessaloniki, Sindos, 57400, Thessaloniki (Greece)
[2]Department of Agricultural Development, Democritus University of Thrace, Nea Orestiada (Greece)
*e-mail: ragkosagrecon@mail.com

Abstract. This study presents the economic performance of transhumant farms, by taking into account two crucial factors: farm size and environmental impact. The analysis is based on technical end economic data from a sample of 121 transhumant farms from Greece which move towards a wide range of summer pasturelands. The farms were grouped according to number of reared animals, thus formulating three groups: <350 animals, 351-600 animals and >600 animals. Economic results and technical and economic indicators have been calculated for each group in order to investigate potential differences stemming from farm size. There are two main findings from the analysis, the first relating to the role of farm size in the economic performance and the second to interactions between economic performance and environmental protection. Indeed, the relationship between transhumance and the environment is two-fold: transhumant flocks contribute to the protection of natural mountainous grasslands and the use of these grasslands becomes an important factor in sustaining their economic viability.

Keywords. Mountainous grasslands – Transhumant sheep and goat – Technical and economic indicators.

Les prairies montagneuses pour soutenir les systèmes d'élevage traditionnels: performance économique des systèmes ovins et caprins transhumants en Grèce

Résumé. *Cette étude présente la performance économique des exploitations transhumantes, en tenant compte de deux facteurs essentiels: la taille des troupeaux et l'impact environnemental. L'analyse est basée sur des données économiques et techniques recueillies via une enquête auprès de 121 exploitations transhumantes Grecques où les troupeaux sont déplacés vers une diversité de pâturages estivaux. Les fermes ont été regroupées en fonction du nombre d'animaux, pour former trois groupes: <350 animaux, 351 à 600 animaux et >600 animaux. Des indicateurs économiques et techniques ont été calculés pour chaque groupe afin d'enquêter sur les différences potentielles découlant de la taille des exploitations. L'analyse produit deux principales conclusions ; la première portant sur le rôle de la taille des exploitations dans la performance économique et la seconde sur les interactions entre la performance économique et la protection de l'environnement. En effet, la relation entre les systèmes transhumants et l'environnement est double : les troupeaux transhumants contribuent à la protection des prairies naturelles de montagne et l'utilisation de ces prairies devient un facteur important dans le maintien de leur viabilité économique.*

Mots-clés. *Prairies de montagne – Transhumance ovine et caprine – Indicateurs économiques et techniques.*

I – Introduction

Transhumant sheep and goat farming in Greece constitutes a multifunctional system, which sustains the livelihood of mountainous communities, as flocks are moved towards mountainous and marginal areas in the summer in order to take advantage of local pasturelands, thus providing employment to farm family members and incomes where jobs in other sectors are not available.

Transhumant animals account for almost 7.5% of the total sheep and goat population in Greece (Laga *et al*., 2012). This study provides a presentation of the economic performance of transhumant farms, by taking into account farm size and environmental impact.

II – Materials and methods

Data for the technical and economic analysis of the transhumant system were gathered through a questionnaire survey in Thessaly, Central Greece. The Region constitutes the center of transhumance in the country, with almost 35% of the reared animals and 30% of transhumant farms (Laga *et al*., 2012).The 121 sampled farms spend the winter in Thessaly, but they are scattered throughout mountainous areas of Northern and Central Greece during the summer. Depending on the number of reared ewes/dams the sampled farms were divided into three groups: <350 animals (40 farms), 351-600 animals (46 farms) and >600 animals (35 farms). A one-way weighted ANOVA was used to detect potential differences stemming from the farm size. Multiple comparisons for all pairs of means were performed using Tukey-Kramer HSD test; the significance level was set to $P<0.05$.

III – Results and discussion

The cultivated land per ewe/dam increases with flock size (Table 1), nonetheless it remains relatively small, because most transhumant farms do not use any arable land. Despite what would be expected, milk yields decrease as farm size increases, but these differences are not statistically significant; one explanation lies on the fact that difficulties in the supervision of large flocks result in decreased productivity. The labour requirements per ewe/dam decrease as farm size increases because some general managerial chores are allocated to more animals; in addition, smaller farms tend to rely mainly on family labour, while the ratio family/hired labour and the hired labour per ewe/dam are significantly smaller for large flocks. These results imply that large farms use hired labour more efficiently.

Table 1. Main technical data of the sampled transhumant farms: average (standard deviation)

	Group 1 (<350 ewes)	Group 2 (351-600 ewes)	Group 3 (>600 ewes)	Mean farm
1. Number of farms (sample)	40	46	35	121
2. Flock size (ewes-dams)	268	451	809	494
	(*54.9*)	(*64.2*)	(*174.9*)	(*240.6*)
3. Cultivated land (ha/ewe-dam)	0.015	0.019	0.026	0.020
	(0.043)	*(0.042)*	*(0.039)*	*(0.041)*
4. Milk yield (kg/ewe-dam/year)	108.1	97.5	90.3	96.0
	(44.5)	*(46.9)*	*(37.8)*	*(43.8)*
5. Labor requirements (h/ewe-dam)	21.6[a]	14.5[b]	9.8[c]	13.5
	(7.5)	*(3.6)*	*(3.0)*	*(7.1)*
Family (h/ewe-dam)	16.5[a]	10.2[b]	7.0[c]	9.8
	(7.9)	*(4.1)*	*(2.8)*	*(6.8)*
Hired (h/ewe-dam)	5.1[a]	4.3[ab]	2.8[b]	3.7
	(5.0)	*(3.9)*	*(2.4)*	*(4.0)*

[†] Means in the same column followed by the same letter are not significantly different ($P \geq 0.05$).

As can be seen in Table 2, milk is the most important element of farm income for all three groups, followed by meat sales. Subsidies account for about 10.4% of the total farm income of the mean farm, nevertheless they vary among groups; smaller farms tend to rely more on subsidies, which was also pointed out by Galanopoulos *et al*. (2011). Note that the Single Farm Payment is not included in subsidies, as it is not coupled to the production process. Cheese production accounts for 1.6%-8.2%, which indicates a scattered and unorganized activity, especially for small farms which do not get engaged because of lack of available labour.

Table 2. Gross output of the sampled transhumant farms by source: average (standard deviation)

	Group 1 (<350 ewes)		Group 2 (351-600 ewes)		Group 3 (>600 ewes)		Average farm	
	€/ewe	%	€/ewe	%	€/ewe	%	€/ewe	%
Milk	98.9[a]	59.3	75.7[b]	53.3	75.0[b]	57.5	79.5	56.4
	(48.1)		*(37.3)*		*(36.7)*		*(42.0)*	
Cheese/Wool	2.7[a]	1.6	11.6[b]	8.2	5.1[ab]	3.9	6.9	4.9
	(7.0)		*(23.7)*		*(11.4)*		*(16.6)*	
Meat	45.0	26.7	39.5	27.8	38.4	29.4	40.0	28.3
	(16.4)		*(18.3)*		*(14.0)*		*(16.5)*	
Subsidies	20.4[a]	12.2	15.2[b]	10.7	12.0[c]	9.2	14.6	10.4
	(4.8)		*(4.3)*		*(4.3)*		*(5.5)*	
TOTAL	167.0[a]	100.0	141.9[ab]	100.0	130.5[b]	100.0	141.0	100.0
	(55.9)		*(51.9)*		*(43.1)*		*(52.4)*	

† Means in the same column followed by the same letter are not significantly different (P ≥ 0.05).

Expenses seem to diminish as the flock size increases (Table 3), due to the efficient allocation of inputs. Although capital expenses are the highest, accounting for 67.3%, 68.4% and 74.1% for the three groups respectively, the contribution of labor is higher than reported in other studies (for instance Roustemis, 2012), which justifies that transhumance is labor-intensive. The use of mountainous grasslands boosts the economic performance of these farms, by reducing nutrition costs which vary from 66.0 to 96.4 €/ewe-dam for the three groups –including crop production costs. These findings are considerably lower than what Roustemis (2012) estimated for an intensive Greek sheep farming system (nutrition costs varied from 157.5-181.5 €/ewe).

The economic performance of transhumant farms is illustrated in Table 4. All groups operate with losses which are heavier for the smaller farms (84.2 €/ewe-dam). The rate of capital return is also negative, which demonstrates that transhumance is not a profitable entrepreneurial activity. However, if it is considered for what it is, i.e. a multifunctional farming activity, the positive farm income for groups 2 and 3 shows that there is perspective for medium and large-sized farms, while the positive gross margin shows that farms are capable of surviving in the short-run and expect for better economic possibilities. Note that the gross profit does not include subsidies in order to examine the economic possibilities of the system without policy distortions.

IV – Conclusions

Smaller farms are more productive but they do not seem to combine their available inputs efficiently, which results in very high production costs. On the other hand, larger farms (350-600 and > 600 ewes) are less productive because of problems in managing large herds, especially under the harsh conditions of summer domiciles in the highlands. Transhumant flocks contribute to the

Table 3. Production costs of transhumant farms by input: average (standard deviation)

	Group 1 (<350 ewes)		Group 2 (351-600 ewes)		Group 3 (>600 ewes)		Average farm	
	€/ewe	%	€/ewe	%	€/ewe	%	€/ewe	%
1. Land rent	**7.4**	3.2	**5.0**	3.1	**5.8**	3.8	**5.8**	3.4
	(7.9)		(7.6)		(5.3)		(7.1)	
2. Labour	**68.2**	29.6	**46.6**	28.5	**34.2**	22.2	**44.6**	26.1
	(24.1)		(12.3)		(11.3)		(22.2)	
3. Capital	**155.3**	67.3	**111.8**	68.4	**114.4**	74.1	**120.8**	70.5
	(63.9)		(45.7)		(54.2)		(57.8)	
3a. Variable capital	130.3	56.5	91.3	55.8	93.5	60.6	99.4	58.1
	(63.4)		*(37.0)*		*(40.9)*		*(52.6)*	
Purchased feedstuff	89.9		63.4		67.8		70.2	
Animal production	33.9		25.3		22.7		25.6	
Crop production	6.5		2.6		3.0		3.5	
3β. Fixed capital	*24.9*	10.8	*20.5*	12.5	*20.8*	13.5	*21.4*	9.7
	(10.9)		*(14.6)*		*(18.3)*		*(14.7)*	
TOTAL	**230.8**	100.0	**163.5**	100.0	**154.4**	100.0	**171.2**	100.0
	(73.6)		*(51.5)*		*(57.8)*		*(57.8)*	

† Means in the same column followed by the same letter are not significantly different (P ≥ 0.05).

Table 4. Financial results of the sampled transhumant farms: average (standard deviation)

	Group 1 (<350 ewes)	Group 2 (351-600 ewes)	Group 3 (>600 ewes)	Average farm
	€/ewe	€/ewe	€/ewe	€/ewe
Gross profit	146.6	126.8	118.5	126.4
	(48.5)	*(59.2)*	*(45.0)*	*(51.6)*
Total expenses	230.8^{a}	163.5^{b}	154.4^{c}	171.2
	(73.6)	*(51.5)*	*(57.8)*	*(57.8)*
Net profit	-84.2^{a}	-36.7^{b}	-35.9^{b}	-44.9
	(52.7)	*(57.4)*	*(70.8)*	*(60.4)*
Rate of capital returns (%)	-11.1^{1}	-4.4^{1}	-3.7^{1}	-5.5^{1}
Farm income	-5.6^{a}	20.3^{ab}	29.1^{b}	19.8
	(79.4)	*(85.1)*	*(55.9)*	*(49.3)*
Gross margin	16.3	35.4	25.0	27.0
	(37.7)	*(50.4)*	*(55.9)*	*(48.5)*

† The superscript (^{1}) denotes the rate of capital return (%).

† Means in the same column followed by the same letter are not significantly different (P≥0.05).

protection of natural mountainous grasslands and also the use of these grasslands becomes an important factor in sustaining their economic viability. A next step in this research would be to evaluate the effects of this multifunctional system on other sectors of society and economy, such as the environment –including biodiversity and mountainous pasturelands–, the viability of marginal rural areas and the maintenance of cultural features in these areas.

Acknowledgements

This paper is part of the project “The dynamics of the transhumant sheep and goat farming system in Greece. Influences on biodiversity” which is co-funded by the European Union (European Social Fund) through the Action “THALIS”. The authors also acknowledge the invaluable contribution of Dr. Zaphiris Abas who died in a car accident on 28 December 2013.

References

Galanopoulos K., Abas Z., Laga V., Hatziminaoglou I. and Boyazoglu J., 2011. The technical efficiency of transhumance sheep and goat farms and the effect of EU subsidies: Do small farms benefit more than large farms? In: *Small Rum. Res*., 100, p. 1-7.

Laga V., Ragkos A., Skapetas V., Mitsopoulos I., Kiritsi S., Abas Z., Mazaraki K. and Bambidis V., 2012. Current trends in the transhumant sheep and goat sector in Greece. In: *Opt. Mediterr., Series A: Mediterranean Seminars,* 102, p. 473-476.

Roustemis D., 2012. Design of the breeding goal for Chios sheep. Doctoral Disseration, Democritus University of Thrace, Greece (In Greek).