

The effect of environmental conditions in the duration of daily grazing itineraries of small ruminants in northeast Portugal.

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INTRODUCTION

In Northeast Portugal, most small ruminant production is an extensive activity based on daily movements of livestock around their villages. In this shepherding system, the flocks walk between 3 and 8 Km, always directed by a shepherd.

The shepherd has a major role in determining the route taken: the length of journey, the resources exploited, and the feeding pattern. Nevertheless, some decisions about the circuit's organization are greatly influenced by the environmental conditions, because animals are very sensitive to extremes of temperature and availability of resources.

The objective of the study is to determine the effect of environmental conditions on the duration of grazing itineraries.

MATERIALS AND METHODS

From May 2000 to May 2001, the grazing circuits of four flocks (two of goats and two of sheep) were monitored in the Bragança region. Each flock was observed one day a month by an operator using a GPS apparatus, from the flock's departure to its return. Fifty two grazing circuits of sheep and goats were observed. The air temperature was registered hourly along the journey.

The circuit's duration was correlated (Pearson simple correlates) with daylight duration and the highest and lowest temperature registered during the day



Tab1: Annual variation of daylight duration, length of grazing itineraries and ratio of both variables.

Month	Daylight duration	Circuit's duration		Ratio circuit's / daylight duration	
		Sheep	Goat	Sheep	Goat
January	561	286	418	0,510	0,745
February	624	326	437	0,522	0,700
March	705	287	482	0,407	0,684
April	786	332	446	0,422	0,567
May	861	558	568	0,648	0,659
June	897	916	667	1,020	0,743
July	883	921	740	1,043	0,838
August	822	841	746	1,023	0,906
September	743	716	652	0,964	0,878
October	657	507	556	0,771	0,846
November	586	342	468	0,583	0,798
December	542	300	381	0,553	0,702

RESULTS AND DISCUSSION

The circuit's duration is strongly affected by the duration of daylight, producing a large annual variation (Fig 1, Tab 1).

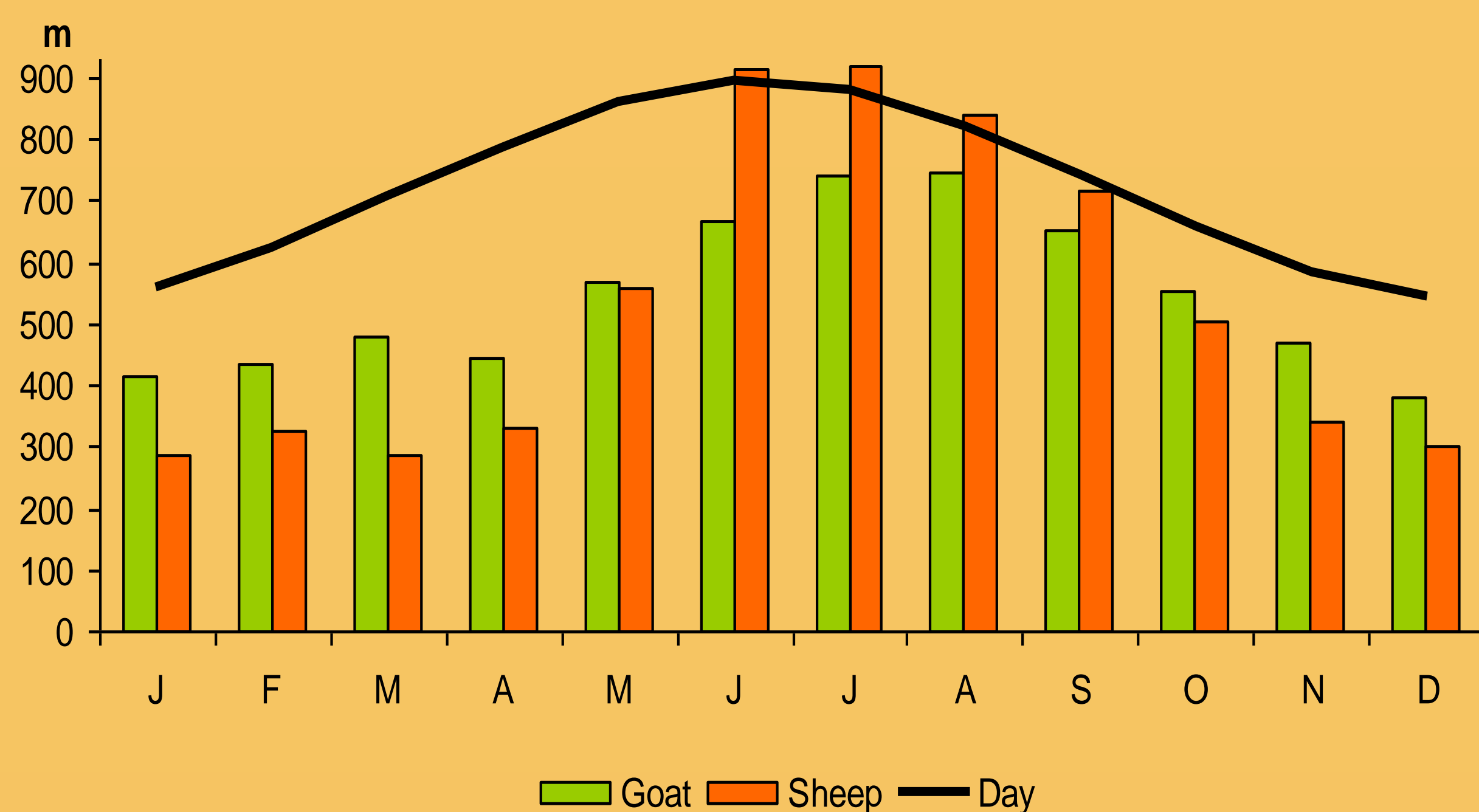


Fig. 1: Annual variation of daylight duration and length of grazing itineraries

Goat grazing itineraries varied between 746 minutes in August and 381 minutes in December; sheep grazing itineraries varied from 300 minutes around the winter solstice and 921 minutes in July (Castro, 2004).

The increase of difference during March and April is related to resource abundance and warm environmental temperature. In contrast, the increase of difference after October – a period of high feed requirements for animals – is probably related to goats' vulnerability to the cold.

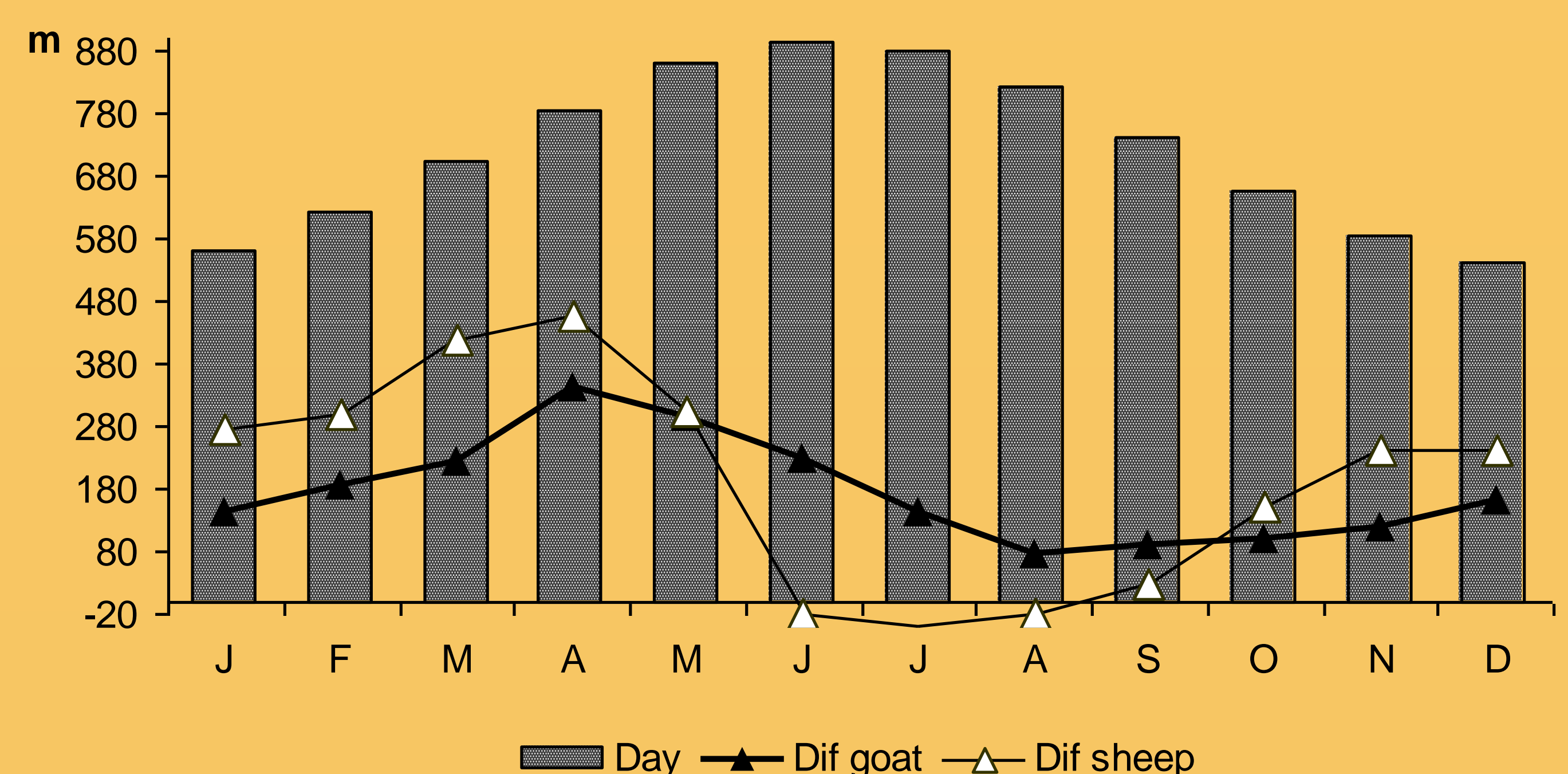


Fig. 2: Difference between daylight duration and length of grazing itineraries.

CONCLUSIONS

Daylight duration determines the duration of grazing circuits, in both sheep and goat flocks. Nevertheless, the abundance of feeding resources and the pattern of temperatures also play an important role in the duration of grazing circuits.

REFERENCES

Castro M (2004) Análisis de la Interacción vegetación-herbívoro en sistemas silvo-pastorales basados en *Quercus pyrenaica*. Tesis Doctoral, Universidad de Alcalá, Alcalá de Henares, 262 pp.



Alteração dos modos de produção e evolução dos sistemas de produção de ovinos e caprinos no início do Sec. XXI