Improvement of productive and reproductive traits in Cyprus Chios sheep and Damascus goats

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INTRODUCTION

➢ The breeding structure of sheep and goat populations in Cyprus is based on a closed nucleus flock system with three tiers: nucleus flocks, multipliers, commercial producers.

➢ Since the 1980s, most efforts have concentrated on the genetic improvement of pure-bred Chios sheep and Damascus goats.

➢ Mating is done solely via natural service (individual hand mating in nucleus flocks).

➢ Government nucleus flocks, located at the Agricultural Research Institute (ARI) and the Department of Agriculture, maintain a total of 600 Chios ewes and 500 Damascus goats.

Breeding Goals at nucleus flocks (sheep and goats):

- Milk production and quality (fat content)
- Meat output
- Fecundity
- Type traits

PROCEDURE

Goal traits:
➢ Part-lactation milk production (60 days), adjusted for fat content (6.0% for sheep and 4.0% for goats)

➢ Growth rate (post weaning growth)
  ➢ 60- and 90-day post weaning growth rate for sheep and goats, respectively

➢ Twinning rate

➢ Type traits (udder conformation)

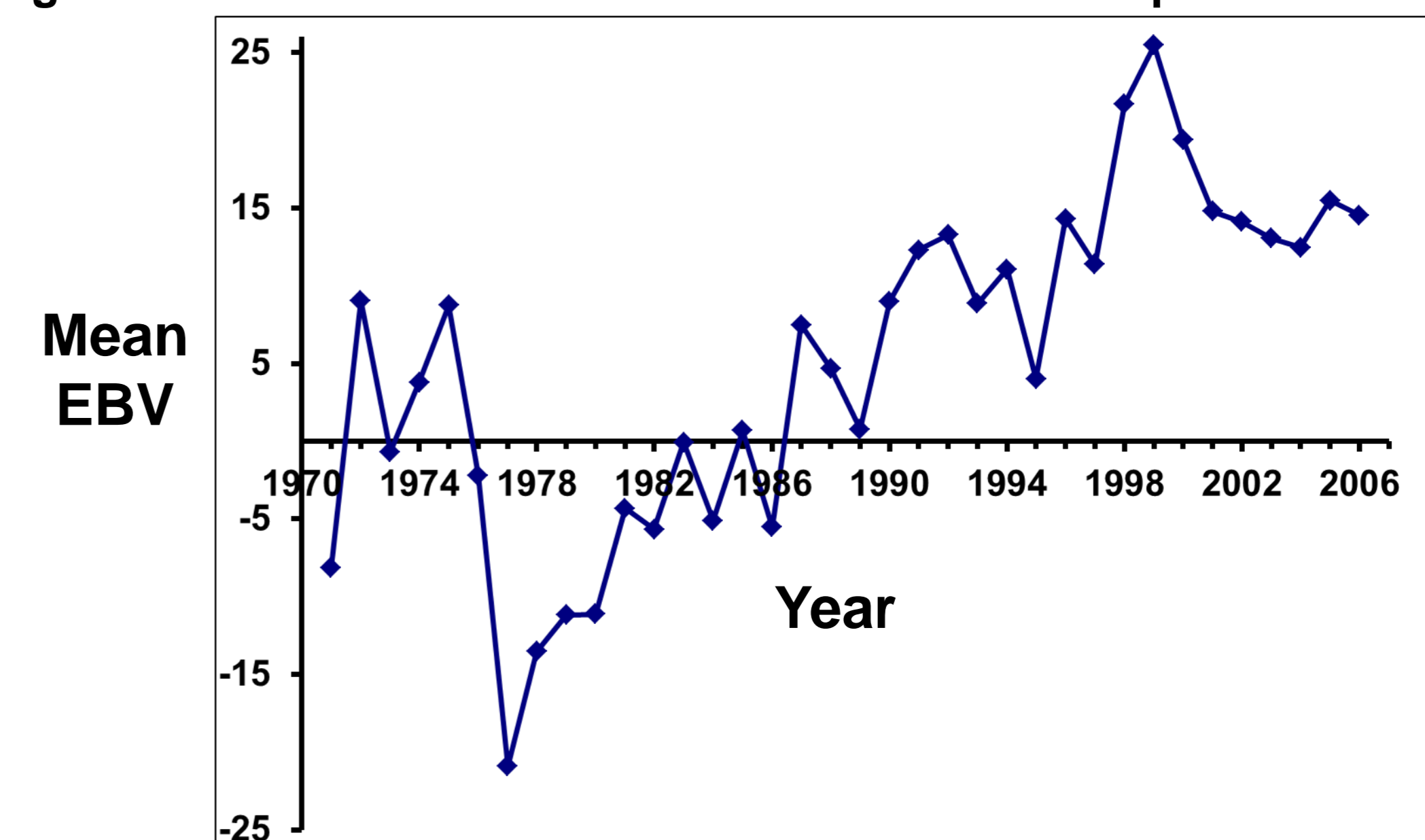### Selection indices (based on genetic parameter estimates):
➢ **60-day Milk Yield**; information from dam and granddam
➢ **Post weaning growth rate;** data of individual animal
Adjustments: Season, dam parity, type of birth

➢ Indices estimated separately for males and females

RESULTS

Figure 1. Genetic trend observed for the Chios sheep nucleus flock over time

Improved estimated breeding values (EBVs) are observed over time from 1980 onward.

Table 1. Means of productive and reproductive traits of Chios sheep and Damascus goats in years 1980 and 2009

Trait	Chios sheep		Damascus goats	
	1980	2009	1980	2009
Total milk (kg)	267 (In 220 days)	337 (in 212 days)	306	474 (in 235 days)
Litter size at birth	1.8	2.1	1.9	2.2
Weaning weight per litter (kg)	21.5	22.8	17.8	26.3
Post weaning growth rate (kg per day)	0.22	0.31	0.14	0.22

Significant improvement in productive and reproductive traits in both Chios sheep and Damascus goats.

KEY POINTS

➢ Part-lactation traits and post weaning growth traits are good predictors for milk yield and meat output evaluation and selection.

➢ In the past 30 years, along with better flock management and disease prevention, genetic evaluation procedures resulted in significant improvement of productive and reproductive traits in both Chios sheep and Damascus goats.

➢ Inclusion of additional traits in the selection indices, such as udder morphology, and mastitis resistance, would lead to more comprehensive selection approaches.

➢ Use of genomic evaluation techniques for the nucleus flocks should be considered.