Advantages and disadvantages of delayed first breeding of dairy goats

F. Panzitta[1*], A. Stella[1] and P.J. Boettcher[2]

[1] FPTP – Centro Ricerche e Studi Agroalimentari, via F.Cervi 93,
Segrate (MI) Italy ; [2] Istituto di Biologia e Biotecnologia Agraria - CNR,
via F.Cervi, 93, Segrate (MI) Italy.

Parco Tecnologico Padano

Consiglio Nazionale delle Ricerche

INTRODUCTION

Most goats mature quickly enough to support reproduction at one year of age. However, milk production increases as they mature physically. For that reason, some goat breeders in Italy choose to delay the time of first kidding until two years of age. This practice is expected to yield greater production during the first lactation, but effects on lifetime production and profit are not known. The objective of this study was to compare lactational performance of goats bred to kid at one year of age versus those for which the first breeding was delayed by one year.

MATERIAL AND METHODS

The data used were records of milk production for 9928 goats calving in Italy during 1999, 2000, 2001 and 2002. Six breeds were represented: four local breeds (Bionda dell'Adamello, Verzaschese, Orobica and Frisa) (Fig. 1, 2, 3, 4) and two cosmopolitan breeds (Alpine and Saanen).
For each parity, average production was compared for goats with standard (1-year) and delayed times of first kidding. Analyses were performed using the GLM procedure of SAS (SAS Institute, Cary, USA).
The model included herd-year of kidding, breed, parity, age at first kidding (1 or 2 years), and the interaction between the last two terms as fixed effects.

RESULTS AND DISCUSSION

Table 1 shows the results of the ANOVA for effects of age at first kidding, parity and their interaction. Not surprisingly, the effect of parity on milk yield was highly significant, as goats tended to produce more milk as they approached maturity. However, the effect of age and first kidding was not significant (P = 0.15). This lack of significance was due to a strong effect of the interaction between effects of parity and age at first kidding. Figure 5 shows trend in the least-square means for production at each parity for each age-at-first-kidding group. As expected, goats kidding first at two years of age produced significantly (P < 0.0001) more milk in their first lactation than did those kidding at one year of age. The difference in average production was about 52 kg per lactation. However, this advantage for delayed kidding disappeared in later lactations, as the late-bred goats tended to produce less. Production was not significantly different in second lactation, and in subsequent lactations the goats that first kidded at 1 yr of age produced significantly more milk. If comparisons were based on age rather than parity number, differences were even more striking. Considering this latter result and the fact that early kidded goats had an extra lactation's worth of production, lifetime yield potential strongly favoured the early kidding strategy.

Fig.1: Bionda
www.agraria.org

Fig. 2: Verzaschese
www.bioinfovet.unimi.it

Fig. 3: Orobica
www.bioinfovet.unimi.it

Fig.4: Frisa
www.bioinfovet.unimi.it

Table 1. Analysis of effect of conventional versus delayed first kidding on production per lactation

Effect	DF	F Value	Pr > F
Parity	9	18.33	< .0001
Age at first kidding	1	2.10	0.1473
Parity * age at first kidding	9	7.86	< .0001

CONCLUSIONS

On the basis of yield per lactation, delayed kidding of goats (i.e. waiting until approximately 2 years of age) was disadvantageous with respect to first kidding at one year. Delayed kidding yielded significant advantages in first lactation, but in later lactations the production of goats with first offspring at one year was superior.
In addition, production level at the same age always favoured precocious kidding. Delayed first kidding can thus only be recommended if such a practice results in increased survival and welfare of goats and additional research is required to test that hypothesis.
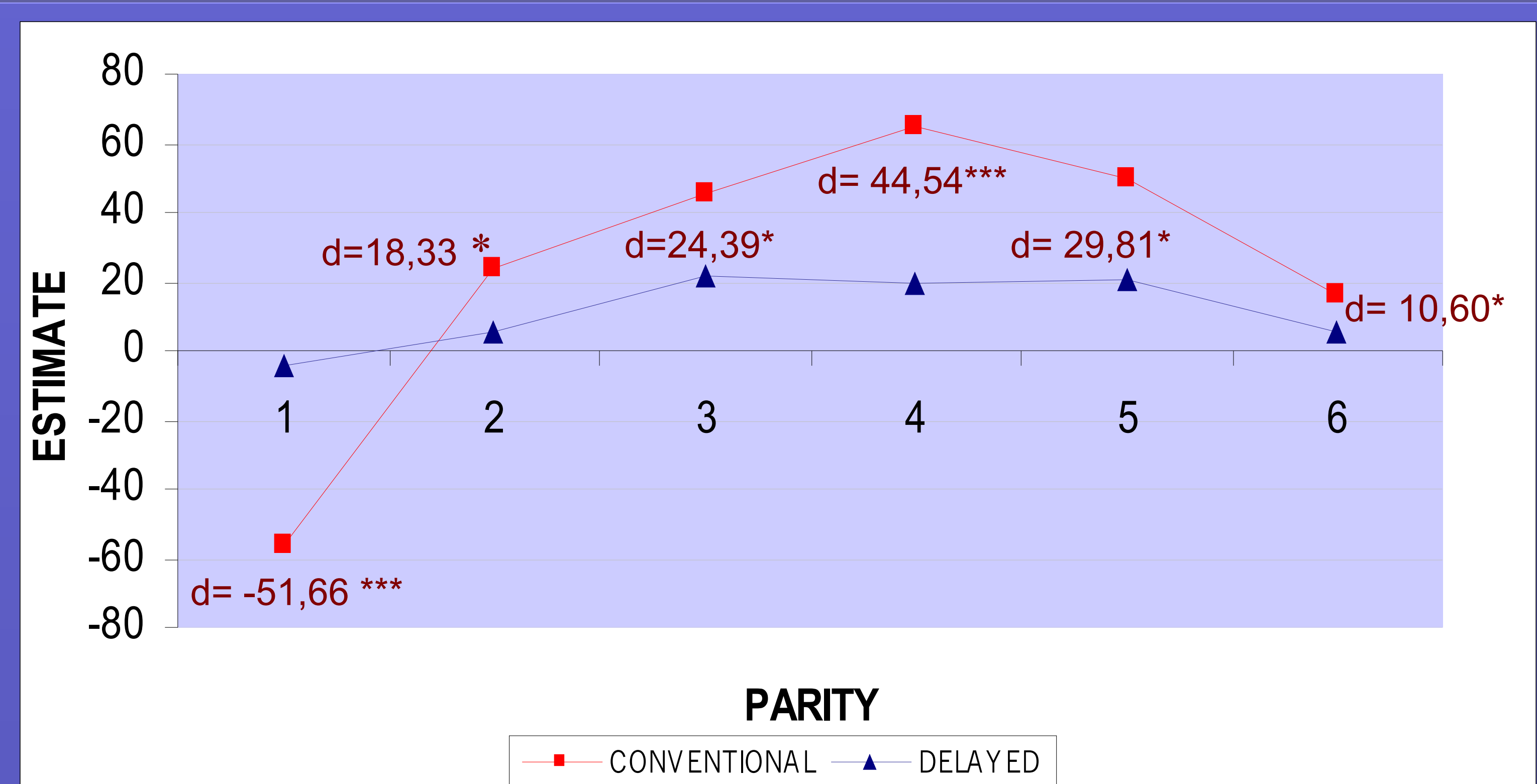

FIGURE 5. Differences of Least Squares Means between Conventional and Delayed first kidding per parity
d= estimated differences
*** = P<0,0001   * = P<0,05