



Research  
Paper

## Estimation of different characteristics of fitted lactation curve in Gir cow

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### ABSTRACT

The present investigation aims to compare the efficiency of seven non-linear models with respect to first to sixth lactations as well as average of six lactations weekly milk yield records of Gir cattle. The weekly milk production (in kg.) data were collected for six various lactations of 352 cows (covering the period 1992 to 2001) of the Cattle Breeding Farm, Junagadh Agricultural University, Junagadh. The various useful characteristics of lactation curve viz., initial milk yield, peak milk yield, time to attain peak milk yield, milk yield in 43<sup>rd</sup> week (last week), rising and declining phases and lactation milk yield (43 weeks yield) were estimated for four out of seven models. It can be suggested that the model proposed by Morant and Gnanasakthy can be employed using non-linear fitting approach to the average lactation records in Gir cow.

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## INTRODUCTION

Every milking day of an animal constitutes the lactation. Generally, in any milch animal, lactation curve reaches peak rapidly in initial period from calving then decreases gradually until the animal goes dry. Thus, lactation curve becomes positively skewed and describes the rate of milk secretion with advance in lactation.

The configuration of different lactation curves remain almost similar in different animals, different breeds within animal and the different lactations within the breed. A shift in lactation curve is generally observed in different lactations. This can be attributed to some genetic and non-genetic factors, viz., age at first calving, sire effect, preceding dry period, season of calving, lactation number, management of farm etc.

These were the models proposed by Morant and Gnanasakthy (Morant and Gnanasakthy, 1989), Inverse Polynomial (Nelder, 1966), Quadratic cum Log and Gamma type model (Wood, 1967). These models were compared for various corresponding characteristics based

on observed records. Parabolic Exponential (Sikka, 1950), Quadratic and Exponential (Brody *et al*, 1923) models were excluded from comparison as they did not provide logical estimates for characteristics.

Apart from prediction of milk production at different point of time, the curve also helps to know how the observed data are distributed. The comparison of two or more lactation curves with respect to peak milk yield, time to reach peak milk yield, rising and declining phases of the milk yield can also be made by fitting an appropriate functional form to lactation curve.

## MATERIALS AND METHODS

The data pertaining to the Gir cow maintained at the Cattle Breeding Farm, Junagadh Agricultural University, Junagadh were utilized. The data comprised of 805 records of 352 Gir cows in first to sixth lactations and extended over period of 10 years from 1992 to 2001. The data recorded on daily morning and evening milk yield in kg. and were compiled into weekly milk yield. The records of