

**LEVEL OF INBREEDING IN JERSEY COWS IN PUNJAB**

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Pedigree, breeding and performance records of the purebred Jersey herd maintained at the Livestock Experiment Station, Bhunikey (Pattoki) Kasur during the period 1982-2000 were utilized for the present study. The coefficient of inbreeding of each animal was calculated using Derivative Free Restricted Maximum Likelihood (DFREML) set of computer programme. Analysis of pedigree records of 602 animals having identification for the extent of inbreeding revealed that only 13 animals (2.16%) were inbred with an average inbreeding coefficient of 24%, the highest level being 25%. Overall average inbreeding coefficient was found to be only 0.0043%. None of the 36 sires used was found inbred. One of the main reasons for low level of inbreeding in the present herd was comparatively shorter time period and the incomplete pedigrees especially for animals born in earlier years. It was concluded that level of inbreeding might increase in future, therefore precise pedigree recording and planned mating strategies be adopted to avoid any adverse effect of inbreeding on performance traits.

**Key words:** Inbreeding, Jersey cow, Punjab.

**INTRODUCTION**

Pakistan supports 22.4 million heads of cattle (Anonymous, 2001), but the per head productivity of our local breeds is low. A herd of 100 Jersey cows was imported during 1985 from USA and kept at the Livestock Experiment Station, Bhunikey (Pattoki). The purpose of this herd was to produce Jersey bulls for cross-breeding with local non-descript cattle for improvement in milk production potential of these animals. Since its inception, due to interruptive and often non-availability of imported Jersey semen, the farm born Jersey bulls have often been used for breeding in this herd. Therefore, inbreeding was expected in this herd which might be one of the reasons of lowered productivity as compared to the original imported herd. Increase in inbreeding usually results in lowered production, which is known as inbreeding depression (Lasley, 1987). The inbreeding coefficient is affected by the amount of pedigree information (Falconer and Mackay, 1997) and the earlier estimates based on few generations may under-estimate inbreeding. The present study was planned to find out the level of inbreeding in jersey cows kept at the Livestock Experiment Station, Bhunikey (Pattoki), district Kasur.

**MATERIALS AND METHODS**

Pedigree, breeding and performance records of 602 purebred animals of Jersey breed maintained at the Livestock Experiment Station, Bhunikey (Pattoki)

Kasur during the period 1982-2000 were utilized for the present study. Identification number of cows with records were used to trace their pedigree back to the base population. The resulting pedigree data consisted of both male (36) and female (566) sides of pedigree and date of birth of each animal. The coefficient of inbreeding of each animal was calculated using Derivative Free Restricted Maximum Likelihood (DFREML) set of computer programme (Meyer, 1991) based on Wright's variance-covariance technique.

**RESULTS AND DISCUSSION**

Pedigrees of the animals were traced back to the base population of Jersey cows to calculate the level of inbreeding in these animals. Analysis of pedigree records of 602 animals having identification for the extent of inbreeding revealed that only 13 animals (2.16%) were inbred with an average inbreeding of 24.0% and the highest level was 25.0%. Overall average inbreeding coefficient was found to be only 0.0043%. Out of the total of 36 sires used, none of them was found inbred. The level of inbreeding in an inbred population reported in a study on Sahiwal cattle in Pakistan during the period 1939-97 revealed that 503 out of 2745 animals (18.31%) were found inbred with an average inbreeding of 3.125% and the highest level being 26.78% (Javed *et al.*, 2001).

One of the main reasons for low level of inbreeding in the present herd was comparatively shorter time period and the incomplete pedigrees especially for

animals born in earlier years. Furthermore it might be due to use of imported semen (12 bulls) for breeding in this herd. About 30% of animals (182) did not have sire identification while number of animals missing dam identification was 28% (167 animals). Number of animals for which both sire and dam identification was missing were 26% (156 animals). The distribution of animals with respect to level of inbreeding has been presented in Table-1.

**Table-1: Distribution of animals with respect to level of inbreeding**

Level of inbreeding (%)	No. of Animals
>25.00	None
25.00	12
12.50	1
Non-inbred	589
Total	602

Effect of inbreeding on performance traits like birth weight, growth rate, age at first calving and milk production could not be calculated due to almost absence or very low level of inbreeding in the present study. It was concluded that level of inbreeding might increase in future, therefore more precise pedigree

recording and planned mating strategies be adopted to avoid any adverse effect of inbreeding on performance traits in this herd.

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