

Comparative Evaluation of Performance of Sahiwal Breed and Jersey x Red Sindhi Crossbred Cattle in Agro-climatic Zone-II of Himachal Pradesh

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ABSTRACT

A total of 13 Sahiwal breed and 12 Jersey x Red Sindhi crossbred heifers were studied for their comparative performance in agro-climatic zone-II of Himachal Pradesh. The means of age at first successful conception (AFSC), age at first calving (AFC), birth weight of calves (BWC), first service period (FSP), first calving interval (FCI), first lactation length (FLL), and first lactation milk yield (FLMY) were 1190.20±52.78 days, 1462.44±57.87 days, 21.50 ±0.21kg, 193.40±18.50 days, 441.45±28.00 days, 242.20±21.64 days, and 1171.16±173.40 litres in Sahiwal and 1239.30±38.26 days, 1521.22±43.00 days, 24.50±0.35 kg, 92.28±18.74 days, 393.60±21.32 days, 287.40±20.49 days, and 1736.83±72.13 days in Jersey x Red Sindhi crossbreds. The results showed that the Jersey x Red Sindhi crossbreds were better performers, having better disease resistance than the Sahiwal breed in the study area.

Keywords: Sahiwal, Jersey x Red Sindhi, Comparative Evaluation of Performance

INTRODUCTION

Sahiwal is one of the best milch cattle breeds of India, having its breeding tract in the undivided Punjab of the Indian subcontinent. Considering its advantages, Sahiwal cows were introduced into different states, including Himachal Pradesh. However, information on reproduction and production performance and disease resistance of Sahiwal in Himachal Pradesh is not available. To fill this gap, a study was planned to

evaluate the production performance of Sahiwal at Palampur (with an altitude of 1355 metres MSL), which falls in the agro-climatic zone-II of Himachal Pradesh, with the coordinates of 32° 6' 37.9512" North and 76° 32' 10.4064" East and features a sub-tropical climate. However, there is a need to compare the performance of Sahiwal with already existing crossbred (Jersey x Red Sindhi) cattle reared at the Livestock Farm Complex of CSK HPKV, Palampur (Zone II), to recommend the area-specific breed to farmers of Himachal Pradesh.

MATERIALS AND METHODS

A total of 13 purebred Sahiwal heifers were purchased from Deen Dayal Upadhyaya Veterinary Science University (DUVASU), Mathura, Uttar Pradesh and introduced into the dairy unit of Livestock Farm Complex, CSK HPKV, Palampur in 2019. The purpose was to evaluate the performance of Sahiwal breed animals in the new environment of Palampur (Zone-II). The animals were reared under a loose housing system and were provided with recommended feed and fodder. The performance of the Sahiwal heifers (n=13) and the Jersey crossbred heifers (n=12) of similar age group, maintained under similar housing and management conditions was recorded in terms of age at first successful conception (AFSC), age at first calving (AFC), birth weight of calves (BWC), first service period (FSP), first calving interval (FCI), first lactation length (FLL) and first lactation milk yield (FLMY). The data so collected were analyzed and compared.

RESULTS AND DISCUSSION

Reproduction Traits: The means of various reproduction traits of Sahiwal and Jersey x

Red Sindhi crossbred cattle are presented in Table I.

Table I: Means \pm SEs of Reproduction Traits of Sahiwal and Jersey x Red Sindhi Crossbred Cattle

Traits	Sahiwal (n=13)	Jersey Crossbred (n=12)
AFSC (days)	1190.20 \pm 52.78	1239.30 \pm 38.26**
AFC (days)	1462.44 \pm 57.87	1521.22 \pm 43.00*
BWC (kg)	21.50 \pm 0.21	24.50 \pm 0.35**
FSP (days)	193.40 \pm 18.50	94.28 \pm 18.74**
FCI (days)	441.45 \pm 28.00	393.60 \pm 21.32*

**Significant at 1% level ($p < 0.01$); *Significant at 5% level ($p < 0.05$)

AFSC: As the animal conceives early, the overall productive life of the animal increases, thereby increasing the gains to the farmers. In the study, the age at AFSC of Sahiwal and Jersey x Red Sindhi crossbred cattle was observed to be 1190.20 \pm 52.78 and 1239.30 \pm 38.26 days, respectively. On the contrary, Meena *et al.* (2024) observed the age at first conception to be 833.90 \pm 9.71 days in Sahiwal, which was lower compared to this study. In high-yielding cows, Novakovic *et al.* (2011) also reported a lower age at first conception as 491.19 \pm 9.36 days. Significantly lower ($P < 0.01$) AFSC of Sahiwal than Jersey x Red Sindhi may be due to their (Sahiwal) early rearing or upbringing in their adaptive environment (Uttar Pradesh) till the age of 15-18 months.

AFC: The age at first calving is an indicator for overall lifetime milk production and the number of total calvings in the lifetime. In the current study, AFC in Sahiwal was found to be 1462.44 \pm 57.87 days. Similarly, the lower values of least squares mean for AFC at the National Dairy Research Institute, Karnal, Haryana, were found to be 1136.14 \pm 10.48 days by Narwaria *et al.* (2015a). For Jersey crossbred animals, the AFC was 1521.22 \pm 43 days. However, the mean age at first calving

in Jersey crossbred was lower (1204 days) (Vinothraj *et al.*, 2016). Dubey and Singh (2005) also found a lower AFC in Sahiwal crosses. The significant ($P < 0.05$) early AFC in Sahiwal (1462.44 \pm 57.87 days) as compared to Jersey crossbred heifers (1521.22 \pm 43 days) may be attributed to their early upbringing in their native and conducive environment (Uttar Pradesh).

BWC: The better the birth weight, the better will be the subsequent development and the survivability of calves. In this study, the average birth weight recorded was 21.50 \pm 0.21 kg in Sahiwal. As all the Sahiwal animals were in the heifer stage or first calving so the birth weight indicates adequate nutrition during pregnancy of these animals. The birth weight in Jersey x Red Sindhi crossbred animals averaged 24.50 \pm 0.35 kg. However, Prabhakar *et al.* (2023) reported the mean birth weight of male calves in first calving in Jersey (1/2) x Red Sindhi (1/2) as 18.11kg, which was significantly lower than that of this study. The higher values of birth weight in Jersey crossbred calves may be due to better genetic potential and better feeding of heifers. Sahiwal, in comparison to Jersey x

Red Sindhi animals, had a significantly ($P < 0.01$) lower birth weight of calves.

FSP: Generally, a service period of 60 days is considered ideal for the dairy enterprise to be economically viable. The FSP in Sahiwal cows was observed as 193.40 ± 18.50 days, and in Jersey x Red Sindhi crosses as 94.28 ± 18.74 days in this study. Singh *et al.* (2020) reported the least squares mean for the first service period as 140.85 ± 8.90 days, which was significantly lower than that of this study. The FSP in the current investigation in Sahiwal was found to be significantly higher ($P < 0.01$) than that of the Jersey x Red Sindhi crossbred animals. This suggested more calvings by crossbred animals than Sahiwal animals in their lifetime. The service period is longer in Sahiwal animals, which suggests that the environmental conditions prevailing in this study.

FCI: In this study, the FCI in Sahiwal was observed to be 441.45 ± 28.00 days and in Jersey x Red Sindhi to be 393.60 ± 21.32 days. Ratwan *et al.* (2021) also found a similar FCI in Sahiwal of 443.47 ± 6.93 days. However, Singh *et al.* (2025) reported a higher first calving interval in Sahiwal as 492.76 ± 8.18 days. The FCI in Sahiwal cows was observed as 536.92 ± 19.11 days and in Jersey x Sahiwal crossbred cows as 530.90 ± 23.59 days by Hadge *et al.* (2009), which was higher than that of this study. However, the FCI was found to be significantly ($P < 0.05$) lower in Jersey x Red Sindhi crossbred animals compared to Sahiwal animals.

Production Traits: The means of various production traits of Sahiwal and Jersey x Red Sindhi crossbred cattle are presented in Table II.

Table II: Mean \pm SE of Production Traits of Sahiwal and Jersey x Red Sindhi Crossbred Cattle

Trait	Sahiwal (n=13)	Jersey x Red Sindhi (n=12)
FLL (days)	242.20 ± 21.64	$287.40 \pm 20.49^{**}$
FLMY (days)	1171.16 ± 173.40	$1736.83 \pm 72.13^{**}$

****Significant at 1% level ($p < 0.01$); *Significant at 5% level ($p < 0.05$)**

FLL: In this present study, a wide variation was observed in lactation length of Sahiwal animals with an average of 242.20 ± 21.64 days. Contrary to this, Narwaria *et al.* (2015b) observed a shorter lactation length in Sahiwal cattle (205.98 ± 5.32) in their first lactation. In Jersey x Red Sindhi crossbreds, LL averaged 287.4 ± 20.49 days. The LL was found to be significantly ($P < 0.01$) lower in Jersey x Red Sindhi crosses as compared to Sahiwal animals. However, Prasanna *et al.* (2023) found non-significant differences among Sahiwal and crossbreds, where the mean FLL in crossbred cows was slightly higher (324.71 ± 9.29 days) than in Sahiwal cows (304.41 ± 13 days).

FLMY: Lactation milk yield is an important trait among all the production traits, as it

reflects the economic gain to farmers and also to predict the genetic potential of animals for milk production. FLMY in Sahiwal cows was observed as 1171.16 ± 173.4 litres. However, Ratwan *et al.* (2020) found a higher lactation yield of Sahiwal in the first lactation of 1822.59 ± 39.30 . In Jersey x Red Sindhi crossbreds, the yield was observed as 1736.83 ± 72.13 litres. The lower yield in the first lactation was also observed by Kharkar *et al.* (2025) in Jersey x Red Kandhari cows as 1100.28 ± 73.18 litres. However, Vijayakumar *et al.* (2019) observed a higher yield in Jersey crossbreds of 2580.11 ± 84.51 litres. The FLMY in Sahiwal was found to be significantly ($P < 0.01$) lower than in Jersey x Red Sindhi cattle. This wide variation in the yield of Sahiwal may be attributed to the variation in

lactation length, as the animals dried early, and hence produced less.

CONCLUSION

The Jersey x Red Sindhi animal was found to be more adaptable in Zone II. However, a larger number of animals need to be evaluated in different agro-climatic zones of Himachal Pradesh to understand the real picture.

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