

Comparative Studies on the Reproductive Efficiency of Imported and Local Born Friesian Cows in Pakistan

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Abstract: Reproductive efficiency is the measure of the ability of a cow to become pregnant and produce viable offsprings. The comparative reproductive efficiency of 50 each imported and local born Friesian cows at Bhunikey (Pattoki), Harichand (Charsada) and Quetta (Baluchistan) was studied. It was concluded that age at first calving differed significantly at different locations ($P<0.05$) for imported and local born cows. The services per conception at Bhunikey and Quetta did not differ significantly for imported and local born but these differed significantly from imported and local born of Harichand. The service period of imported and local born cows at Bhunikey was significantly longer ($P<0.05$) than cows at Harichand and Quetta did not vary significantly in imported and local born except Harichand. There was no significant difference in milk yield of imported and local born cows at Quetta. However, at Bhunikey and Harichand, imported cows produced significantly ($P<0.05$) more milk than their progeny and all these classes produced significantly more milk than imported and local born at Quetta. Calving interval of imported and local born cows at Bhunikey was significantly longer ($P<0.05$) than the Harichand and Quetta but did not differ significantly for imported and local born cows. Mean dry period for imported and local born at Bhunikey is significantly ($P<0.05$) longer than that of Harichand and Quetta, but there was no significant difference between the imported and local born at different locations.

Key words: Reproductive efficiency, friesian cows, Pakistan

Introduction

Reproductive efficiency is the measure of ability of a cow to become pregnant and produce viable offsprings. It is the most important factor determining the fertility of animals and success of livestock operation. The importance of milk as the cheapest source of animal protein needs no emphasis. In Pakistan, average per capita availability of milk is about 155 l per annum (Anonymous, 1997). In the country, buffalo and cow population is about 21 and 18 millions, respectively and cows contribute approximately 23% of the total milk production which is very low as compared to buffalo, i.e., 72% of total milk production (Anonymous, 1997). Attempts have been made to increase milk production by introducing high yielding exotic cows. The traits of great economic importance in dairy cattle breeding include fertility, milk yield, butter fat

percentage and productive life span. All these traits depend upon reproductive efficiency of cattle. Gilmore (1951) stated that animals having higher reproductive efficiency will produce more milk and offsprings in their life span than their herd mates. Friesian cows (Bull mother) were imported from Holland, Denmark and USA for production of exotic breed bulls for cross breeding with low producing indigenous cattles to increase the milk production of cattles in the country. This project was designed to study the (performance) adoptability of these imported cows and their daughters in different climate, management and feeding conditions of Harichand (Charsada) NWFP, Quetta (Balochistan Bhunikey (Pattoki) Punjab).

Materials and Methods

In this project reproductive efficiency of 50 imported and 50 local born (born in Pakistan after AI of their imported Dams) Friesian cows kept at LES Bhunikey, Harichand and Quetta were studied. The data on following aspects were collected for the study of reproductive efficiency of imported and local born cows kept under same conditions of management, feeding, and also under different management feeding and climatic conditions. The data were collected from history sheets of individual cow on following aspects. Identification (T.NO), Date of Birth, Date of successful A.I, Date of calving Date of drying, Milk yield per lactation. Animals with incomplete records or less than 180 days lactation were excluded from Analysis. Data pertaining to following parameters were analyzed.

Age at first calving, No of services per conception, Service Period (S.P.) Calving interval (C.I.), 305 days milk yield (M.Y.), Dry period (D.P.).

The data of Friesian cows maintained at 3 locations were analyzed by two way ANOVA (Steel and Torrie, 1982).

Results

Age at first calving

The difference in age at first calving at different locations was significant ($P < 0.05$) but age at first calving of local born and imported cows varied oppositely between Harichand and Quetta from Bhunikey.

Services per conception

The results showed significant difference of services per conception at Bhunikey and Quetta from Harichand for imported and local born cows. There was no significant difference between imported and local born cows at Bhunikey, Quetta and Harichand.

Service period

The service period is the duration from calving to the next conception. It is an important trait which mainly effect the calving interval and control the reproductive efficiency of the herd.

Table 1: Reproductive efficiency of imported and local born friesian cows in Pakistan

Class	Age at first calving (days)	Services per conception (number)	Service period (days)	Milk yield (liters)	Calving interval (days)	Dry period (days)
Imported	823.22 ±8.70d	2.11 ±0.09a	259.30 ±16.28a	4850.77 ±138.70a	539.55 ±19.18a	279.75 ±17.80a
Local Born	765.00 ±14.10e	2.10 ±0.12a	283.56 ±21.20a	3918.70 ±91.40b	567.8 ±21.91a	283.12 ±21.40a
Imported (Quetta)	888.51 ±15.3c	2.16 ±0.1a	209.85 ±17.69b	3456.47 ±75.09cd	480.89 ±17.00b	146.25 ±9.25b
Local (Q)	1051.0 ±29.2a	2.03 ±.08a	206.22 ±11.62b	3306.00 ±88.00cd	487.99 ±18.35b	148.09 ±10.42b
Imported (HRRR±)	851.90 20.7cd	1.42 ±0.06b	154.69 ±11.12c	3511.08 ±73.90c	436.43 ±3.50b	122.67 ±12.95b
Local (H)	973.0 ±25.9b	1.47 ±0.06b	190.16 ±16.87bc	3181.89 ±88.40d	449.81 ±11.94b	152.25 ±14.78b

Values with different superscript letters differ significantly ($P < 0.05$)

The result showed that service period at Bhunikey is significantly longer in imported as well as local born as compared to that at Harichand and Quetta. In present study there is no significant difference in the service period of imported and localborn at station except Harichand [$P < 0.05$]. This study showed that S.P does not vary within the breed but different management: nutrition and location significantly affected this trait. The S.P for local and imported H.F at Bhunikey is significantly longer than imported and local born at Harichand and Quetta .

Milk yield

The results showed that milk production of H.F of Bhunikey was significantly higher than Harichand and Quetta in class of imported as well as local born. The milk production of imported herd at Bhunikey was significantly higher from their progeny. Their is no significant difference in the milk production of imported herds at Harichand and Quetta but significant difference between the imported and local born at Harichand showed that production of dutch Friesian is significantly higher from their progeny. There was no significant difference in the milk production of imported and local born at Quetta. Milk yield of local born at Quetta was significantly higher from local born at Harichand.

Calving interval

The duration between two successive calvings is called calving interval. The calving interval of imported and local born H.F cows was significantly longer at Bhunikey than imported and local born Friesian cows at Harichand and Quetta. The calving interval of imported and local born did not differ significantly in class and location at Herrichand and Quetta.

Dry period

The result showed that dry period is significantly longer at Bhunikey as compared to Harichand and Quetta for imported and local born but there was no significant difference in imported and local born at Harichand and Quetta.

Discussion

The age at first calving of the imported cows at Bhunikey, Herrichand and Quetta are in line with reports of Ozelick and Arpacick (1996) 860 and 886 days for holstein Friesian in Anatolia but age at first calving for local born do not coincide with this report it might be due to better management and feeding of young stock. The results for local born at Herrichand and Quetta are in report of Rafique *et al.* (2000) 1040 days for FrxSwl Age at first calving in farm born at Bhunikey is in line with Alim (1985) in Libya 759 days. Age at first calving in local born at Harichand is in line with Bodisco *et al.* (1971) 930 days in Venezuela. The result of local born at Quetta are in line with the result of Kumar in India (1980) as reported 1070±33; 1092±49 days in farm born cows imported from Austria and Newzealand respectively.

The results of Friesian in the present study at Bhunikey and Quetta (2.1) are in line with the report of Ozbeyaz *et al.* (1996) Rafique *et al.* (1996); (2000) 2.31, 2.2 services/conception for Swiss Brown and Friesian Sahiwal crossbred respectively. It is also in line with Younis *et al.* (1976) 2.23 for H.F cows but the result at Harichand are not in line with these reports. The results of imported and local born at Harichand are in line with reports of Dias *et al.* (1985) in Brazil 1.4±0.03 services/conception for 668 pure and crossbred Friesian cows (1968-80). This study showed that hot climate of Bhunikey suppressed the reproductive system but not the conception rate in imported and local born Friesian cows.

The study showed that climate of Quetta is more suitable for Friesian so there is no difference in the S.P (209, 206 days) of imported and local born Friesian as Kumar *et al.* (1980) reported S.P of 216±10 days but did not vary significantly between imported and local born cows but is not in agree with Ugur *et al.* (1994) 150 days for Simmental cattle in Turkey. The S.P of imported cows at Harichand (154 days) are in line with Ugur *et al.* (1994) in Turkey 150 days for Simmentel cattles. The S.P (154 days) of imported are in line with report of Arora and Sharma (1983) 140 days S.P. in 199 Friesian cows in India. Mangerker *et al.* (1985) reported 186.6 days S.P. in Friesian cows which is in line with 190 days of local born at Harichand but do not coincide with results of this study (259, 283, 209, 206 days) for imported and local born at Bhunikey, Quetta (209 \$ 206 days) and also 154 days of imported at Herrichand. The S.P. (259 days) of imported cows at Bhunikey is close to the reports of Bodisco *et al.* (1971) 236.9 and 223.5 days for imported and local born Friesian cows in Vanzuella respectively. The significantly longer S.P. at Bhunikey might be due to many reasons: 1. Longer hot and humid climate of Bhunikey affected health of lactating animals very badly and indirectly reproductive system which resulted in longer service period. 2. As the limited numbers of cows were imported no culling was practiced for a longer period 3.-After the import due to problems of contagious diseases and acclimatization controlled breeding was practiced to save the life of animals. One of the reasons of longer S.P. in local born Friesian cows could be that high yielder young cows loose the body

condition very badly in the stress full season of Bhunikey which affected S.P. in H .F particularly in local born cows. The milk production of imported herd at Bhunikey is close to report of Lindhe (1996) 6822, 6328 kg for Danish Red cows, Norwegian Red cows and Janikey (1982) 5868; 6381, 6775 Kg from 1-3 lactations of imported H.F cows imported [pregnant] from Canada and U.S.A and Perz *et al.* (1985) 5359±1512 kg 322±64 days in Chile but production of local born (3918 kg) at Bhunikey, M.Y (3456, 3306 kg), ((3511, 3181 kg) of imported and local born at Quetta and Herrichand donot coincide with these reports which might be effect of breed location and management etc. The milk production of local born at Bhunikey is in line with the report of Guerrah and Menendez (1983) 3915±20 kgs for pure bred H.F in cuba. Alim (1985) reported the milk yield of 3897±1213 lits/ 393±58 days in Libya which is in line with present production of local born at Bhunikey but less than the imported herd. The milk production of imported herds at Quetta and Harichand, local born at Quetta was in line with reports of Boujenance and Ba, Huba *et al.* (1986); (1997) 3345±804 Kg in 305 days of 807 imported Holstein Friesian cows and Salovakian cattle 3419.6 and 3246.1 Kg but these are not in line with milk yield of imported and local born at Bhunikey. Milk production of local born cows at Harichand was close to reports of Khattab and Ashmway (1988) 3045±271 Kg/ 305 days. They also reported significant effect of farm, days open on milk yield as seen in this study at Bhunikey, Quetta and Harichand.

The calving interval of imported and local born Friesian cows (449, 436 days) at Harichand were in line with the report of Ali *et al.* (1983) 421±6 and 436±0 for Friesian cows and their progeny. Although non significant trend of higher calving interval has been noted in local born generation. These results are also in line with Jahageerdar *et al.* (1996) 439, 420, 423 days calving interval for 1st, 2nd and 3rd calving in Friesian cows. The calving interval of imported and local born at Herrichand were very close to the reports of Ugur *et al.* (1994) 436 days. The results of Quetta (480, 487 day) with Kumar *et al.* (1980) 496 days. The results of Bhunikey do not coincide with these reports. Salazar and Heurtas (1976) reported 585 days calving interval that is in line with the result of present study at Bhunikey. The longer C.I. in Friesian cows at Bhunikey might be due to high milk yield, unfavourable stress full hot and humid climate, no culling of animals on basis of longer calving interval for long time (on account of long service period).

The dry period was longer in Pakistan when compared to the reports of other country. Our result at Bhunikey coincide with Laffolock *et al.* (1974) reported effect of preceding D.P on subsequent M.Y in H.F. The result of the study for imported and local born Friesian cows at Quetta, local born at Herrichand are close to the result of Rafique *et al.* (2000) 169 days for 50% (F×S) crossbred and Cheema Samad 177 days D.P in herd of Friesian cows but these reports are not in agreement with (279 and 283 days) dry period for imported and local born at Bhunikey due to more production and unfavourable season. Khalfalla (1988) reported that dry period was longer for summer calver than in winter calver. At Bhunikey D.P. was more in the hot and humid climate because weak cows were early dried at the farm to cope with the stress of the hot and humid season. The results of this study indicated significant effect of location on dry period. As Abubaker (1986) reported 70±34 and 88±68 days D.P. for Holstein Friesian in Mexico and Columbia these reports do not coincide with the results of this study due to different location management and feeding practices etc.

The present study was aimed to compare the performance of imported and local born Friesian cows at different locations (Bhunikey, Harichand and Quetta). The salient features of economic traits studied are summarized as follows:

1. The age at first calving significantly differed in local born Friesian cows at different locations and also significant difference seen in imported and local at same location.
2. There was no significant difference of services/conception in imported and local born at the location. The effect of location was significant.
3. There was no significant difference in the S.P. of imported and local born at the location. The location has significantly effected S.P.; The longer S.P. at Bhunikey may be due to hot and humid climate. The longer S.P may be due to adverse seasonal stress which suppress reproductive activity.
4. Calving interval did not vary significantly between imported and local born Friesian but location effected significantly at Bhunikey.
5. Milk yield differed significantly between imported and local born except Quetta.
6. The dry period at Bhunikey was significantly longer both in imported and local born Holstein Friesian cows. As the milk production in the Friesian cows at Bhunikey was higher which may be due to longer calving interval and more rest period.

According to this study the performance of the exotic herd at Bhunikey was not satisfactory from economic point of view but production record is better when compared with other two herds. However further investigations are required to draw clear cut recommendation on the performance of pure bred exotic herd in punjab. But the performance of exotic herd at Harichand and Quetta was excellent from reproductive point of view.

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