**Studies on Morbidity profile of Gir crossbred with the age, year and season of MPKV Rahuri, Maharashtra, India**

**ABSTRACT**

The research was under taken by utilizing data generated at RCDP on cattle, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra. The data of morbidity cases 8274 morbidity cases of animals were recorded over the period from 2000 to 2017 were utilized for the present study. The morbidity at various age, year, season, birth weight and causes of morbidity observed. The significance of various factor under study was tested by chi-square test.The overall morbidity cases were 8274 during the period of 2000-2017 out of which 40.91 per cent were Half breds, 36.8 per cent were Phule Triveni and 22.4 per cent were 5/8 th Gir crosses. The highest morbidity was recorded in the age group of (3-10 years) with the advancement of age and disposed of due increased mortality with the advancement of period. According to the birth weight, the highest morbidity was found in the birth weights (20-25 kg) than the heavy weight. According to season the highest morbidity occur in rainy season fallowed by winter and summer season. The maximum number of cattle was morbid due to mammary gland disorder, followed by specific disorder or injury disorder. In mammary gland disorder, mastitis was the major cause, while specific disorder, lameness weakness, pyrexia. Highest morbidity and injury disorder were wound viz., vaginal wound, knee and leg wound accounted for higher morbidity in Gir crossbred. The overall study on morbidity had given typical direction and pin pointed a specific age i.e. 3-10 years and birth weight 20-25 kg.

**(Key words:** morbidity, disorder, variation, age, periods, season)

**INTRODUCTION**

India is predominantly an agricultural country. Agriculture and livestock are complementary and supplementary to each other in their production. Livestock sector plays an important role in socio-economic development of the country and it’s an important source of income for farmer and rural people. The success of livestock industry depends on good heath of livestock that helps to increase the productivity. Whereas any compromise on health ground will shatter the hope of livestock sector. Inspite of advancement made in the animal husbandry practices, clinical medicine and diagnostic technique, the morbidity and mortality due to various causes continues to be higher in farm area. To minimize economic losses due to various diseases have to studies of association of various factors such as age, gender, season and managemental practices with incidences of diseases have special importance in planning of prevention and control strategies designed to reduce the incidences of diseases in livestock. Cattle are owned by most of the families though milk production is not in the front of business enterprise. However, the production performance of cattle is greatly reduced due to various diseases [7-10].

Several causes have been noticed in morbidity of the crossbreed cows. The morbidity was the highest in calf and steadily declines with the advancement of the age. The climatic factors and seasonal variation also govern the rate of morbidity. The changes in feeding and management regime can create the problems in digestive system likewise on overall immunity of the animals. Livestock should be regularly vaccinated to protect them from many infectious and contagious diseases. Animal diseases can cause enormous economic loss through morbidity. Therefore, its productivity is lowered if not healthy.

**MATERIALS AND METHODS**

The study was carried out by collecting the data regarding the morbidity and of Gir crosses i.e. FG, Phule Triveni and 5/8th Gir from history and pedigree sheets, health register, treatment registers and allied records maintained over a period of 17 years (2000 to 2017) at Research-Cum-Development Project (RCDP) on Cattle, Mahatma Phule Krishi Vidyapeeth Rahuri, Dist.-Ahmednagar (MS).Disorder wise morbidity in Gir crossbred classified into mammary gland disorder,specific disorder, injury disorder, reproductive disorder, digestive disorder and eye disorder. The data on morbidity of animal were presented according to period group, age groups, birth weight groups, season and expressed as per centage to the total calf population in Gir crosses. The differences due to period group, age group, season, birth weight groups etc. were tested for their significance by Chi-square test (Snedecor and Cochran, 1994). formulae were used to determine the morbidity profile of Gir crossbred (Schwabe et al., 1977).

**RESULTS AND DISCUSSION**

**Table 1 Disorder wise morbidity in Gir crossbred**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Disorders** | **Genetic group** | | | |
| **Half bred** | **Phule Triveni** | **5/8 Gir** | **Total** |
| **Mammary gland disorder** | **1123** | **910** | **648** | **2681** |
| Morbid animal % | 13.6 | 11.0 | 7.8 | 32.4 |
| **Injury disorder** | **536** | **437** | **193** | **1166** |
| Morbid animal % | 6.5 | 5.3 | 2.3 | 14.1 |
| **Digestive disorder** | **376** | **298** | **165** | **839** |
| Morbid animal % | 4.5 | 3.6 | 2.0 | 10.1 |
| **Reproductive disorder** | **399** | **448** | **260** | **1107** |
| Morbid animal % | 4.8 | 5.4 | 3.1 | 13.4 |
| **Eye disorder** | **31** | **38** | **35** | **104** |
| Morbid animal % | 0.4 | 0.5 | 0.4 | 1.3 |
| **Specific disorder** | **917** | **910** | **550** | **2377** |
| Morbid animal % | 11.1 | 11.0 | 6.6 | 28.7 |
| **Total number of morbid cases** | **3382**  (40.9) | **3041**  (36.8) | **1851**  (22.4) | **8274**  (100.0) |
| **Total number of available animals** | **1838**  (43.41) | **1429**  (33.75) | **967**  (22.83) | **4234**  (100.0) |
| **Chi-square test** | 67.066\*\* | | | |

It is observed from Table 1 disorder wise morbidity on the basis of total number of morbid animals in Gir crossbred had significantly (P < 0.01) higher morbidity due to mammary gland disorder (32.4 %), followed by specific disorder (28.7 %), injury disorder (14.1 %), reproductive disorder (13.4 %), digestive disorder (10.1 %) and eye disorder (1.3 %), respectively. However, on the basis of number of available animals, the corresponding per centage were 63.3, 56.1, 27.4, 26.0, 19.7 and 2.4, respectively.

In Half bred higher morbidity was due to mammary gland disorder (13.6 %) followed by Specific disorder (11.1 %) Injury disorder (6.5 %), Reproductive disorder (4.8 %), Digestive disorder (4.5 %) and Eye disorder (10.4 %), respectively. In Phule Triveni higher morbidity due to Mammary gland disorder (11.0 %) and Specific disorder (11.0 %) followed by Reproductive disorder (5.4 %) ,Injury disorder (5.3 %), Digestive disorder (3.6 %) and Eye disorder (0.5 %) and in 5/8 Gir bred higher morbidity due to mammary gland disorder (7.8 %) followed by Specific disorder (6.6 %),Reproductive disorder (3.1 %), Injury disorder (2.3 %), Digestive disorder (2.0 %) and Eye disorder (0.4 %) respectively.

Chaudhary *et al.* (2013) reported varied results indicating that young and adult stocks had high morbidity due to specific Disorders as 84.68 % and 68.42 %, respectively. Sundaram (2010) observed that maximum morbidity occurred due to reproductive disorder followed by digestive disorder. Also Suneel *et al.* (2015) reported that maximum morbidity in cattle (43.14 %) and buffalo (27.78 %) was due to specific disorders. Bangar *et al.* (2013) observed that maximum morbidity occurred due to reproductive disorder (7.09 %) followed by Digestive disorder (5.14 %). Uttam *et al.* (2015) found that reproductive Disorders (8.75) followed by specific disorder (1.43 %)in animal.

**Table 2 Age wise morbidity in Gir crossbred**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age** | **Genetic group** | | | |
| **Half bred** | **Phule Triveni** | **5/8 Gir** | **Total** |
| **A1(0-3 Months)** | **395** | **399** | **199** | **993** |
| Morbid animal % | 4.8 | 4.8 | 2.4 | 12.0 |
| **A2(3-6 Months)** | **75** | **105** | **62** | **242** |
| Morbid animal % | 0.9 | 1.3 | 0.7 | 2.9 |
| **A3(6-12 Months)** | **86** | **115** | **40** | **241** |
| Morbid animal % | 1.0 | 1.4 | 0.5 | 2.9 |
| **A4(1-3 Years)** | **374** | **428** | **222** | **1024** |
| Morbid animal % | 4.5 | 5.2 | 2.7 | 12.4 |
| **A5(3-10 Years)** | **1978** | **1706** | **1162** | **4846** |
| Morbid animal % | 23.9 | 20.6 | 14.0 | 58.6 |
| **A6(Above 10 Years)** | **474** | **288** | **166** | **928** |
| Morbid animal % | 5.7 | 3.5 | 2.0 | 11.2 |
| **Total number of morbid cases** | **3382**  (40.9) | **3041**  (36.8) | **1851**  (22.4) | **8274**  (100.0) |
| **Total number of available animals** | **1838**  (43.41) | **1429**  (33.75) | **967**  (22.83) | **4234**  (100.0) |
| **Chi-square test** | 89.807\*\* | | | |

The age wise morbidity was depicted in the Table 2 Age had significant (P<0.01) influence at morbidity in Gir crossbred. Highest morbidity was recorded in the age group of 3-10 years i.e. adults (58.6 %). While, lowest morbidity was occurred in 3-6 months age (2.9 %) and 6-12 months (2.9 %) age group followed by 0-3 months (12.0 %), 1-3 years (12.4), above 10 years (11.2 %), respectively. It indicated that adults were more susceptible to the disorders as compare to calves of age groups 0-3, 3-6, 6-12 months and 1-3 years. High adult morbidity might be due to rearing of old and senile animals.

In half bred highest morbidity was recorded in the age group of 3-10 years (23.9 %) while lowest morbidity was recorded in 3-6 months (0.9 %) followed by in the age group of Above 10 years (5.7 %), 0-3 months (4.8 %), 1-3 years (4.5 %), 6-12 months (1.0 %), respectively. In Phule triveni breed higher morbidity noticed in the age group of 3-10 years (20.6 %) while lowest morbidity was recorded in 3-6 months (1.3 %) followed by in the age group of 0-3 months (4.8 %), 1-3 years (5.2 %), Above 10 years (3.5 %), 6-12 months (1.4 %), respectively. In Gir 5/8 breed higher morbidity recorded in the age group of 3-10 years (14.0 %) while lowest morbidity was recorded in 6-12 months (0.5 %) followed by in the age group of 1-3 years (2.7 %), 0-3 months (2.4 %), Above 10 years (2.0 %), 3-6 months (0.7 %), respectively.

Morbidity obtained according to age group was coincided with the result obtained by Chaudhary *et al.* (2013) reported similar results indicating that young and adult stocks had high morbidity rate (35.73 %) followed by calves (26.98 %) and young stocks (23.17 %).

**Table 3 Period wise morbidity in Gir crossbred**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Period** | **Gir Crossbred** | | | **Total** |
| **Half bred** | **Phule Triveni** | **5/8 Gir** |
| **P1(2000-2002)** | **325** | **167** | **134** | **626** |
| Morbid animal % | 3.9 | 2.0 | 1.6 | 7.6 |
| **P2(2003-2005)** | **520** | **249** | **183** | **952** |
| Morbid animal % | 6.3 | 3.0 | 2.2 | 11.5 |
| **P3(2006-2008)** | **434** | **280** | **263** | **977** |
| Morbid animal % | 5.2 | 3.4 | 3.2 | 11.8 |
| **P4(2009-2011)** | **491** | **496** | **436** | **1423** |
| Morbid animal % | 5.9 | 6.0 | 5.3 | 17.2 |
| **P5(2012-2014)** | **955** | **731** | **470** | **2156** |
| Morbid animal % | 11.5 | 8.8 | 5.7 | 26.1 |
| **P6(2015-2017)** | **657** | **1118** | **365** | **2140** |
| Morbid animal % | 7.9 | 13.5 | 4.4 | 25.9 |
| **Total number of morbid animals** | **3382**  (40.9) | **3041**  (36.8) | **1851**  (22.4) | **8274**  (100.0) |
| **Total number of available animals** | **1838**  (43.41) | **1429**  (33.75) | **967**  (22.83) | **4234**  (100.0) |
| **Chi-square test** | 434.172\*\* | | | |

The period wise morbidity was shown under the Table 3 and which indicated that the morbidity was the significantly (P<0.01) highest during the period 2012-2014 (26.1 %) followed by 2015-2017 (25.9 %), 2009-2011 (17.2 %), 2006-2008 (11.8 %), 2003-2005 (11.5 %) and lowest morbidity was noticed during 2000-2002 (7.6 %). In half bred the significantly, highest morbidity of 11.5 per cent was recorded during the period from 2012-2014, while in Phule Triveni it was the highest (13.5 %) during the period 2015-2017. The lowest morbidity of 3.9, 2.0 and 1.6 per cent was noticed in Half bred, Phule Triveni and 5/8 Gir crosses during 2000-2002. It is clearly pointed out that with the advancement of period the morbidity was increased, which may be due to changes in climatic factors, feeding and management regimes during the period of time.

**Table 4 Season wise morbidity in Gir crossbred**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Season** | **Gir Crossbred** | | | **Total** |
| **Half bred** | **Phule Triveni** | **5/8 Gir** |
| **S1 (Rainy)** | **1405** | **899** | **742** | **3046** |
| Morbid animal % | 17.0 | 10.9 | 9.0 | 36.8 |
| **S2 (Winter)** | **1212** | **1137** | **553** | **2902** |
| Morbid animal % | 14.6 | 13.7 | 6.7 | 35.1 |
| **S3(Summer)** | **765** | **1005** | **556** | **2326** |
| Morbid animal % | 9.2 | 12.1 | 6.7 | 28.1 |
| **Total number of morbid animal** | **3382**  (40.9) | **3041**  (36.8) | **1851**  (22.4) | **8274**  (100.0) |
| **Total number of available animal** | **1838**  (43.41) | **1429**  (33.75) | **967**  (22.83) | **4234**  (100.0) |
| **Chi-square test** | 153.937\*\* | | | |

The morbidity noticed under different season in various genetic groups under study is cited in Table 4 The result presented in Table 4 revealed that season and breed wise morbidity in Gir crossbred was the significantly (P < 0.01) highest in rainy season (36.8 %) followed by winter season (35.1 %) and summer season (28.1 %). In rainy season highest morbidity was found in half bred (17.0 %) followed by Phule Triveni (10.9 %) and 5/8th Gir (9.0 %). In winter season highest morbidity was found in Half bred (14.6 %), Phule Triveni (13.7 %) and 5/8th Gir (6.7 %). In summer season highest morbidity was found in Phule Triveni (12.1 %), Half breed (9.2 %) and 5/8th Gir (6.7 %). The results on morbidity obtained was coincided with the result of Shaikh  *et al.* (2009) who reported the morbidity rate in cattle in summer, rainy and winter season as 23.51, 47.59 and 28.89 per cent, respectively

**Table 5 Birth weight wise morbidity in Gir crossbred**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Birth weight** | **Gir Crossbred** | | | **Total** |
| **Half bred** | **Phule Triveni** | **5/8 Gir** |
| **B1(Below 20 kg)** | **552** | **610** | **331** | **1493** |
| Morbid animal % | 6.7 | 7.4 | 4.0 | 18.0 |
| **B2(20-25 kg)** | **1738** | **1439** | **1173** | **4350** |
| Morbid animal % | 21.0 | 17.4 | 14.2 | 52.6 |
| **B3(Above 25 kg)** | **1092** | **992** | **347** | **2431** |
| Morbid animal % | 13.2 | 12.0 | 4.2 | 29.4 |
| **Total number of morbid animals** | **3382**  (40.9) | **3041**  (36.8) | **1851**  (22.4) | **8274**  (100.0) |
| **Total number of available animal** | **1838**  (43.41) | **1429**  (33.75) | **967**  (22.83) | **4234**  (100.0) |
| **Chi-square test** | 162.185\*\* | | | |

The birth weight and disorder wise morbidity was depicted in Table 5 It was clearly noticed that the animals with low birth weight were less prone to morbidity. However, the highest morbidity of 16.4 per cent was recorded in the animals under birth weight group 20-25 kg due to mammary gland disorders, followed by specific disorders (15.8 %) in the same birth weight group. The second targeted group of morbidity was the animals with birth weight of above 25 kg and similar trend of morbidity due to disorders was noticed under this group also.

The results indicated that though the birth weight of the animals was less it does not have much influence on morbidity

**CONCLUSION**

The overall morbidity during the period of 2000-2017 out of which 40.91 per cent were Half breds, 36.8 per cent were Phule Triveni and 22.4 per cent were 5/8 th Gir crosses **.** In all the genetic groups major cause of morbidity was mammary gland disorder followed by specific disorder. The crossbred cows from the age group 3-10 years were found to be more congenial for morbidity. However, rainy and winter season were found to be more prone for morbidity

**References:**

1. Bangar, Y., Khan, T.A., Dohare, A.K., Kolekar, D.V., Wakchaure, N. and Singh, B. 2013. Analysis of morbidity and mortality rates in cattle in Pune division of Maharashtra state, *Vet World.* 6(8) : 512-515.
2. Chaudhary, J.K., Singh, B., Prasad, S. and Verma, M.R. 2013.Analysis of morbidity and mortality rates in bovine in Himachal Pradesh. *Vet World.* 6(9): 614-619.
3. Sundaram, S. 2010. Estimation and analysis of morbidity pattern in cattle in Cauvery delta Region of Tamilnadu. M.V.Sc. Thesis, Indian Veterinary Research Institute, Deemed University.
4. Uttam, S., Singh, B., Choudhary, J.K., Bassan, S., Kumar, S. and Gupta, N. 2015. Analysis of morbidity and mortality rates in bovine under village condition of Uttar Pradesh. The Bioscan. 10(2) : 585-591.
5. Shaikh SR. 2009. Estimation and analysis of morbidity and mortality in cattle under village condition of Maharashtra [MVSc dissertation]. Izatnagar, Bareilly: IVRI.
6. Sarkar TK, Banik S, Ganai TA, Singh PK, Ganai N. Mortality pattern in exotic and crossbred sheep at an organized farm of Kashmir valley. The Indian Journal of Small Ruminants. 2008;14(2):218-23.
7. Madalena FE, Peixoto MG, Gibson J. Dairy cattle genetics and its applications in Brazil. Livestock Research for Rural Development. 2012 Jun 20;24(6):1-49.
8. Bercovitch FB, Berry PS. Reproductive life history of Thornicroft’s giraffe in Zambia. African Journal of Ecology. 2010 Jun;48(2):535-8.
9. BHOTTE U, Sutar DA, Ulmek BR. Effect of season and period on semen characteristics of two and three breed Gir crosses. The Indian Journal of Animal Reproduction. 2005 Jun 30;26(1):43-5.
10. MOTE MG. Genetic and non-genetic factors affecting calf survivability in Gir crossbreds. Indian Journal of Dairy Science.;76(3).