

# IMPACT OF ENVIRONMENT, MANAGEMENT AND AWARENESS OF OWNERS ON REPRODUCTION IN CATTLE – A STUDY UNDERTAKEN IN A FEW VILLAGES UNDER RED LATERITE ZONE OF WEST BENGAL

*A Thesis  
Submitted to the  
West Bengal University of Animal and Fishery Sciences  
in partial fulfillment of the requirements for the degree of Master of  
Veterinary Science  
in*

**VETERINARY GYNAECOLOGY AND OBSTETRICS**

By

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**Department of Veterinary Gynaecology and Obstetrics  
Faculty of Veterinary and Animal Sciences  
West Bengal University of Animal and Fishery Sciences**

2008

*Dedicated  
To  
My Beloved Parents*



# West Bengal University of Animal and Fishery Sciences

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## CERTIFICATE

This is to certify that the work recorded in the thesis entitled **"IMPACT OF ENVIRONMENT, MANAGEMENT AND AWARENESS OF OWNERS ON REPRODUCTION IN CATTLE- A STUDY UNDERTAKEN IN A FEW VILLAGES UNDER RED LATERITE ZONE OF WEST BENGAL"** submitted by Sunirmal Saren in partial fulfillment of the requirements for the degree of **Master Of Veterinary Science in Veterinary Gynaecology & Obstetrics** under West Bengal University of Animal and Fishery Sciences, is the faithful and bonafide research work carried out by the candidate himself under my personal supervision and guidance. The research findings presented in the thesis have not so far been submitted for any other degree or diploma. The assistance and help received during the course of investigation have been duly acknowledged.

Dr. S. K. Ray  
Chairman

Advisory Committee

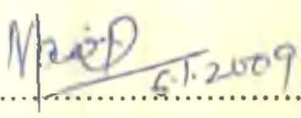
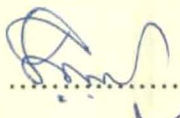

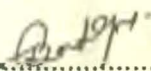
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**APPROVAL OF EXAMINERS FOR THE AWARD OF THE  
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We, the undersigned, having been satisfied with the performance of **Sunirmal Saren** in the Viva-Voce Examination conducted today, the *06th January, 2009*....., recommend that the thesis be accepted for the award of the Degree of **Master of Veterinary Science in Veterinary Gynaecology and Obstetrics**.

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*Sunirmal Saren*  
**(Sunirmal Saren)**

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## **LIST OF ABBREVIATIONS**

<b>A.I.:</b>	Artificial Insemination.
<b>ARD:</b>	Animal Resource Development.
<b>et al:</b>	et alia (and others)
<b>BQ:</b>	Black Quarter.
<b>CPR:</b>	Common Property Resources
<b>Deptt:</b>	Department.
<b>°C :</b>	Degree Centigrade.
<b>FAO:</b>	Food and Agricultural Organization.
<b>FMD:</b>	Foot and Mouth Disease.
<b>g:</b>	Gram
<b>HS:</b>	Heamorrhagic Septicaemia.
<b>Kg:</b>	Kilogram.
<b>KM:</b>	Kilomertre.
<b>Ltd:</b>	Limited.
<b>Mm:</b>	Millimetre.
<b>N.S.:</b>	Natural Service.
<b>NIC:</b>	National Informatics Centre.
<b>%:</b>	Percentage.
<b>SOI:</b>	Survey of India.
<b>WB:</b>	West Bengal
<b>Viz:</b>	videlicet (namely).

# Chapter - 1



## Introduction

# INTRODUCTION

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The rapidly growing human population in the world with limited resources faces a great challenge for adequate food supply. Animal products like milk seem to have some important role to satisfy this increasing demand especially in the developing countries like India. Though it is fact that India has the highest cattle population in the world (219.642 million, FAO, 2002), this country ranks second in cow milk production (35 million tonne, FAO 2002), which is far below than that of the USA ( 75.025 million tonne, FAO, 2002) due to poor per capita productivity of milk from our cows. The state of West Bengal is not the exception to this. In West Bengal cattle population is 182.74 lakh but per capita availability of milk ( 119.48 g/day) Dept of ARD, Govt. of West Bengal, 2000-2001) is far less than the recommended level of 220 g/capita/day (Taneja *et al.*, 2002) and the reason is all the same. A couple of factors, viz., poor genetic make up of the animal and inadequate plane of nutrition, do not allow the optimization of the production potential and this leads to poor productivity.

West Bengal has the second highest indigenous cattle population in the country after Madhya Pradesh. The state has 15 lakh Jersey crossbred population as compared to 1.74 lakh Holstein Friesian cross-bred cattle population. (Arundhati Singh, Deputy Director, Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, New Delhi, July 2006)

Animal husbandry in India is essentially an endeavor of millions of small land holders and landless poor. As high as 70% of livestock in India is owned by 67% of small and marginal farmers and by the landless. They rear animals on crop residues and common property resources (CPR), generally allowing them to compete with man for food grains. Small holders contribute 62% of total milk production and 60% of livestock farming labours is carried out by women and more than 90% of work related to animals is rendered by women folk of the family (Singh, 2000). Indian economy is largely based on agriculture and livestock farming where more than 80% people are dependant on the above stated profession. India has the highest population of bovine. As per FAO (1998) report there were above 209 million cattle in India and it stands nearly 16% of the total world cattle population. About 46% of cattle of Asia are found in India (FAO Data Bank, 1998).

Only a few exotic animals are present in the country and all of them are maintained at the recognized herds. A small proportion is represented by crossing between exotic and domestic stock. Our indigenous animal is rich in variability and is endowed with many positive aspects like disease resistance, tolerance to high ambient temperature and humidity and other characteristics suitable to this particular agro-climatic environment. However their productivity levels are generally low as far as milk yield is concerned. For instance, the average milk production of most of the cattle breeds varies from about 455 to 1364 kg in a lactation period of 250 to 350 days (Nivsarkar, 2000). These factors however, need not have prevailed as a drawback, as it is possible to improve the yields and other

performance parameters through selective breeding. Though India is having one of the largest cattle population in the world and also produces largest amount of milk in the globe, but the per capita milk production is very low. The reasons behind this is the genetic constitution of the cattle and reproductive disorders leading to infertility (Livestock census, 1996-1997).

The district Bankura in West Bengal exhibits the same picture. But with some special features of having a red laterite rather infertile soil, low-rainfed drought-prone area inhabited by a vast population below poverty level enjoying very limited amenities available to them, which has ear marked this district being underdeveloped and different from the other districts of this state. However, the people of this district in this aspect tried to be united through formation of "The Kangsabati Co-operative Milk Producer's Union Limited."

This particular phenomenon appears to be beneficial to persons related with animal husbandry sector. But most of the people of the area are unaware of the minimum service to be rendered to their domesticated animals to get optimum return from them. Due to this unawareness, numbers of infertile animals are increasing regularly. This may prove to be a big obstacle on the way of socio-economic development of the milk producer farmers of this district.

An interesting fact of this district is that a few poor farmers keep their calves to others to be reared with a little subsidy in the form of milk for 1 or 2 lactation. When the calves are returned from them the animal becomes infertile due to

inadequate management. The magnitude of benefit for the farmers increases from milk when the facilities of milk storage and regular marketing of milk at better price becomes available. In some cases, some rich and developed farmers purchase high yielders to get more benefits. But due to inadequate farming system and livestock management, those animals also become victim of malnutrition which may result into infertility. Sometimes misguided by middleman/touts, the farmers become prey to purchase defective or infertile animals.

Unawareness regarding the economic benefit from proper animal husbandry practices, weak socio-economic status of rural people, lack of proper knowledge regarding animal husbandry, influences of unskilled personnel or touts, poor infrastructure, nonavailability of periodical deworming and vaccination facility, transportation problem, improper availability of trained AI worker and AI at right time etc. may be at the root of poor performances of livestock in this area.

In India, the incidence of anoestrus has been reported to be varying from 12-37% (Naidu and Rao, 1981) to 64.8% (Luktuke and Sarma, 1978). Sing et al., (1981) have reported that the incidence of anoestrus (39.01%) has been the highest of the total reproductive disorders. Disorders due to mineral deficiency is not identifiable with frank deficiency signs. So there is a need for continuous survey on mineral status of soil, feeds and fodder and livestock of different agro-climatic zones, so that any suitable measure can be taken to cope up the problems. In this regard, minerals, particularly some major and trace elements, play very crucial role. Deficiency of a single or

combined minerals and their imbalances may cause various reproductive failures such as infertility, poor conception, anoestrus, etc. Hidioglou, (1979). Mineral deficiency in animals may be related either to low intake or to antagonistic effects between different minerals (Humphries *et al.*, 1983). However, a large no. of livestock in the world, particularly in the tropics, suffer from deficiencies or imbalance in mineral nutrition (McDowell *et al.*, 1993). Distribution of minerals is widely variable in plants and animals and there exists a direct 'soil-plant-animal relationship' so far as the mineral nutrition of livestock is concerned. It is also generally accepted, that the tropical forages are less suitable than the temperate ones, which results in reduced availability of minerals to the animals from the tropical forages (McDowell *et al.*, 1986). Continuous exposure to deficiency of essential minerals through feeds and fodder may result in failure of the homeostasis affecting the productive and reproductive potential of the animal.

West Bengal which falls in the tropical region can be divided into six agro-climatic zones as follows:-

- i. Northern hilly zone (Darjeeling district, except Siliguri sub-division).
- ii. Tarai zone (Jalpaiguri, part of Cochbehar and part of Darjeeling districts)
- iii. Old alluvial zone (Part of Cochbehar and Jalpaiguri, part of Malda, North Dinajpur and part of South Dinajpur Districts)

- iv. New alluvial zone (Part of Malda and part of South Dinajpur, Mursidabad, part of Burdwan, Nadia, Hooghly, Howrah, North 24 parganas and part of South 24 parganas and East Midnapore districts)
- v. Red laterite zone (Purulia, Bankura and part of West Midnapore districts)
- vi. Coastal saline zone (Part of East Midnapore and South Midnapore and South 24 Parganas districts)

It is mentioned, that survey work relating to reproductive disorders in cattle were under taken previously in the districts of West Bengal under alluvial zones, but there was dearth of information on the impact of environment, management and farmers' awareness on fertility of cattle reared in the drought-prone districts under red laterite zone of this state and hence the present work was taken up.

Therefore, with the existing situation stated above, the present investigation, which was restricted to some parts of the Red laterite zone was necessary to be performed. The objectives of the present investigation were as follows:-

- a) To ascertain and compare between the feeding and managerial practices, practiced in the Kangsaboti milk producers' Union Ltd. adopted and non adopted villages.

b) To study the effect of environment, nutrition and awareness of the farmers with their managerial practice on the reproductive performance of the animals.

c) To study the magnitude of infertility (anoestrus, repeat breeding and poor estrus) of the animals examined.

d) To study the effect of deworming followed by vitamin-mineral supplementation to uplift the reproductive status of the anestrus cattle of the area.

# Districts of West Bengal



# Chapter - 2



## Review of Literature

# *REVIEW OF LITERATURE*

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## **1.1: INCIDENCE OF INFERTILITY**

Khan and Luktuke (1967) collected data from Haryana cows, which did not show signs of estrus for 3 months after calving and were considered as cases of post-partum anoestrus. They reported that the annual incidence of anoestrus condition ranged from 0.60 to 12.13 percent.

Zemjanis *et al.* (1969) reported that the incidence of poor oestrus was 11% in pre service cycles.

Araunjo *et al.* (1975) examined 2500 cows in 20 herds, of which 42.60% did not exhibit estrus for more than 5 months after calving.

Brestensky *et al.* (1977) studied on the incidence of infertility in 474 dairy cows during a period over 6 years in 231 dairy farms, of which 60.8% animals were infertile.

Roin and Soloniemi (1978) examined 2304 infertile cows in 283 herds over one year period, of which 13.2, 8.2, 20.3 and 5.6 percent animals had been suffering from anoestrus, repeat breeding, silent estrus and delayed ovulation conditions, respectively.

Luktuke and Sharma (1978) reported that the incidence of true anoestrus having inactive ovaries in rural cattle and buffaloes were 43 percent, and 32.82 percent, respectively.

Naidu and Rao (1981) reported that the incidence of anoestrus and repeat breeding condition was 13.13 and 6.80 percent respectively, after examination of 800 crossbred and 700 indigenous cows in Andhra Pradesh.

Kaikini *et al.* (1981) collected data from 84 female jersey × Gir F1 crossbred cows, of which the incidences of repeat breeders were 19.86 and 21.98 percent, respectively. Sharma and Luktuke (1983) collected data from 83 Friesian × Harijana, 80 Brown Swiss × Harijana and 91 jersey × Harijana cows covering 5 lactations. The incidence of anoestrus within 90 days post partum were 19.08, 17.13 and 10.86 percent, respectively.

Sreemannarayana and Rao (1997) reported that the postpartum anoestrus and repeat breeding condition were 25.7 and 7.3 percent, respectively, in crossbred cows.

Lucy (2001) noted, that cows with the greatest milk production have the highest incidence of infertility.

Gustafsson and Emanuelson (2002) claimed that the total percentage of repeat breeding condition was 10.10% in Swedish dairy herds.

## **1.2: NUTRITION AND MANAGERIAL PRACTICES**

Parker and Blowey (1976) noticed that nutritional deficiencies and over feeding are major causes of infertility.

Herrick (1977) observed that protein deficiency retards the development of the sex organs and body growth in young animals and affects subsequent reproductive performance.

Fracos *et al.* (1977) observed that nutritional deficiencies or excess are frequently referred to as the cause of infertility.

Soulsby (1982) reported that serum protein and hemoglobin levels reduced significantly due to gastro-intestinal parasites and liver flukes.

Sane *et al.* (1982) suggested that low level of total serum protein (TSP) and low blood hemoglobin content might be responsible for causing anoestrus condition in crossbred heifers in association with heavy helminth infestation.

Chetty and Rao (1986) reported that the TSP and Hemoglobin deficiencies in the anoestrus heifers might be due to very poor animal husbandry practices, lack of deworming programme and nutrition.

Morrow (1986) found that herd health and profitability suffers commonly due to underlying nutritional deficiencies.

Reddy and Reddy (1988) observed that normal productive and reproductive behaviour in domestic animals are closely associated with interaction between hormonal and nutritional status of the animal system.

Forshel *et al.* (1991) observed in their study, that over feeding with carbohydrates and protein could cause infertility problems.

Blanchard *et al.* (1990) opined that excess of protein would increase embryo mortality.

Roche *et al.* (1992) reported that the incidence of anoestrus in dairy cattle is usually attributed to defective managerial practices in the farm.

Chaney (1993) reported that mineral concentrations in plant generally reflect the adequacy with which the soil can supply absorbable mineral to their roots. As for example, excessive Zn storage in the soil from pig manure may be toxic to plants and reduce their growth.

Underwood and Suttle (1999) observed that huge application of chemical fertilizers in the soil leads to deficiency of minerals in feeds and fodders and animals suffer from that.

Lucy (2001) opined that steroidogenic capability of luteal cells was also dependant on hormones such as somatotropin, insulin and IGF-1, which are controlled by the nutrition of the cow.

Boland (2002) reported, that high dietary intake or high metabolic load associated with management of high yielding dairy cows inhibit normal oocyte development and establishment of pregnancy, leading to infertility.

### **1.3: AGE OF APPEARANCE OF FIRST OESTRUS**

Kumaran (1951) recorded the mean age at first oestrus in Tharparkar breed as 683 days (range of 427 to 988days) and in Sahiwal breed as 677 days (range of 427 to 954 days).

Rajgopalan (1952) recorded the mean age at first oestrus in Sindhi heifers as  $1030.80 \pm 35.30$  days and  $1114.75 \pm 44.90$  days in Kangayam breed.

Ahuja *et al.* (1961) reported that the age at first oestrus in Haryana heifers was 919 days.

Purbey (1965) observed age at first oestrus and the first fertile heat in Dangi cows as  $1107.50 \pm 42.02$  days and  $1154.00 \pm 35.11$  days, respectively.

Sane *et al.* (1968) reported that the mean age at first estrus in Red Sindhi breed as  $957.50 \pm 18.34$  days and  $1184.00 \pm 48.20$  days in the Gir breed.

Velhankar (1973) recorded the average age at puberty in Gir heifers as  $911.31 \pm 75.75$  days.

Deshpande *et al.* (2000) reported that the average age at first oestrus in Deoni cattle was  $36.60 \pm 0.53$  months.

#### **1.4: SEASONAL EFFECT ON REPRODUCTIVE EFFICIENCY**

Hillen *et al.* (1960) observed that lowered conception rate during summer months was due to low fertilization rate and high embryonic death rates during the summer months in Holstein and Jersey cattle.

Kelly and Hurst (1963) observed that high ambient temperature depressed feed consumption and milk production and resulted in a 10% reduction of pregnancy rate in exotic breed.

Vanheerden (1963) observed that the Zebu cattle are not affected to the same extent like European cattle, when the external temperature goes above 73° F.

Gangwar *et al.* (1965) observed that under hot climatic condition, the duration of estrus was reduced.

Singh and Pandey (1970) reported that there was non-significant difference between seasons on non-breeding efficiency of the cow.

Grewal *et al.* (1974) reported that the month and season of insemination had no effect on the conception rate in Haryana cows.

Dutta *et al.* (1980) observed that the conception rate was higher in winter season as compared to other seasons in cattle.

Tiwari and Kushwaha (1982) reported about higher reproductive efficiency in the winter and spring season in Sahiwal cows.

Bandinga *et al.* (1985) reported that high ambient temperature causes seasonal depression in reproductive efficiency.

Methekar *et al.* (1992) reported that the breeding efficiency was not significantly affected by the season in Jersey cows.

Sreemannarayana and Rao (1997) showed that oestrus activity was more during cool season but almost an equal in hot dry and humid seasons.

Srivastava and Sahani (1999) observed that non-descript cows had no marked seasonal effects on oestrus but it certainly effect conception rate, which was higher in cool season.

Prasad *et al.* (2001) claimed that the highest percentage (12.40%) of conception rate was recorded in the month of March, whereas it was lowest (3.5%) in the month of August.

### **1.5: CLINICAL MANIFESTATION OF INFERTILITY**

Sane *et al.* (1958) experimentally studied in 8 heifers and the animals were showing anoestrus symptoms with flabby uterus, soft, atonic small ovaries.

Despande and Sane (1977) reported that among 350 cows, 90 cows were exhibiting prolonged post-partum anoestrus condition. Rectal examination revealed that in 70% cows, the ovaries were soft and smooth and in 30%, the ovaries were hard with no graafian follicle or corpus luteum, indicating that they were inactive.

### **1.6: PREVALENCE OF INFERTILITY IN CATTLE**

Despande and Sane (1977) reported that 90 cows out of 350 were exhibiting prolonged post-partum anoestrus in different breeding farms of cattle at Bombay.

Luktuke and Sharma (1978) studied 360 anoestrous animals comprising 42 heifers, 98 buffalo heifers, 86 cows and 131 buffalo cows in rural areas in Bareilly district of U.P. These animals were investigated for determining incidence of 'true anoestrus'. It was found that 36.16% heifers, 56% buffalo heifers, 43% cows and 38.2% buffalo cows had inactive ovaries and could be considered as cases of true anoestrus.

Bertoni (1990) described the possible causes of low fertility in dairy cows including deficiency and excess in vitamins and minerals and toxic substances in feed.

Niekerk *et al* (1990) conducted trials throughout 1986 and 1987 at Nortier experimental Farm, South Africa, to compare plasma Cu and Zn concentrations in Simental cattle, Dorper sheep and Boer goats under extensive grazing conditions. Cu concentrations were lowest in cattle (around 60µg/dl), indicating slight deficiency and producing infertility. Zinc levels showed no conclusive differences between these species.

Das (1991) observed that among 110 cattle, 4 (6.16%) showed anoestrus with productive disorders and 21.10% showed repeat breeding condition in 5 villages of Midnapore district, West Bengal.

#### **1.7: THERAPEUTIC MEASURES:**

Kolb (1959) reported that in Scandinavia, prophylactic administration of 0.25 g of manganese per day to dairy cattle increased fertility rate.

Schwarz and Kirchgissner (1978) studied for 6 wks with 75 high yielding cows and they were given daily supplementation with copper sulphate, H<sub>2</sub>O and observed that plasma Cu glycinate in a sterile oily base reduced the infertility in young heifers.

Hiridoglou (1980) reported that the young cattle had shown a general response in infertility to 2 g MnSO<sub>4</sub> daily but the general recommendation was that daily supplementation with 4 g MnSO<sub>4</sub> (providing 980 mg elemental manganese) was needed for treatment of infertile cattle.

Sampath and Amritkumar (1984) reported that supplementation of 50 g CuSO<sub>4</sub> and 1 g CoCl<sub>2</sub>/100kg concentrate mixture to heifer induced estrus to 77% heifers (13 months of age), 78% (24 to 36 months of age) and 89% (over 3 years of age).

Das (1991) studied the efficacy of CuSO<sub>4</sub>, FeSO<sub>4</sub> and CoSO<sub>4</sub> against anoestrus condition without reproductive tract disorder and against repeat breeding condition in cattle. Out of 15 animals studied, 8 animals (53.33%) and out of 14 animals studied, 7 animals (50%), respectively showed gradual improvement of fertility after therapy.

Fraser *et al.* (1991) reported that supplementation of Mn (40 ppm) in the diet reduced infertility in cattle.

Sarkar (2006) Study on the reproductive disorders was carried out on 20 cows in order to relieve cows from suffering of the diseases in a cheaper way as the diseases were the main problem in the study areas. Massage on ovaries by palpation method was successfully applied, wash the uterus and intravenous injection of 30c.c 10 times diluted logul's Iodine at two weeks interval for treatment of affected cows suffering from anoestrus. Use of logule's Iodine and palpative massage on ovaries, rupture of the mature follicles, was very effective and less expensive. It would be the profitable method for the farmers. In case of massages and Iodine treatment, the conception rate was high (81%).

# Chapter - 3



## Materials and Methods

# ***MATERIALS AND METHOD***

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The survey was conducted in a few villages of Ranibandh Block of Bankura district, (situated at 60 KM distance approximately, from Bankura), WB, India.

## **1.1: LOCATION AND EXTENT:**

Bankura is located in the western part of the State of West Bengal. It is a part of Bardhaman Division of the State and is included in the area known as "Rarh" in Bengal. It ranks 4th according to Population and literacy rate of 2001 Census in the State. The District Bankura is bounded by latitude 22°38' N and longitude 86°36'E to 87°47' E.

River Damodar flows along the northern boundary of the district. The adjacent districts are Bardhaman in the north, Purulia in the west and Paschim Medinapore in the south.

**1.1.2: Northern Zone:** Durgapur Barrage, Gandoa Dam & Koropahar.

**1.1.3: South Zone :** Mukutmonipur, Jhilimili, Sutan, and ECO Park at Taldangra, Talberia, Terracota Project at Panchmura etc.

**1.1.3: Western Zone:** Susunia Hill & Beharinath Hill.

**1.1.4: Eastern Zone :** Temples of Bishnupur, Joyrambati

## **1.2: AGRICULTURE AND SOIL:**

Climatic condition depending upon rainfall , temperature , humidity and altitude accompanied by various complex land form, hydrology, soil combination has greatly influenced the farming system of Bankura District. In Bankura District, two Agro Climatic Zones, namely, 'Undulating Red and lateritic' zone exists in Sonamukhi, Joypur, Bishnupur, Ranibandh, Gangajalghati , Borjora, Saltora, Onda, Taldangra, Simlapal, Mejhia, Raipur, Sarenga, Chhatna, Indpur, Khatra, Hirbandh, Bankura-I and Bankura-II blocks and Vindhyan Alluvial Zone exists in Patrasayer, Indus, Kotulpur Blocks. The Red and Lateritic Zone is within tropical dry sub-humid area having rainfall ranging from 1100 to 1400 mm and temperature being maximum 45°C and minimum 10° C usually. This region is primarily undulating with mounds and valleys and exhibiting different grades of laterisation process in soil formation . Soils are well drained, susceptible to soil erosion due to rapid external drainage or run off, soil reaction ranges from acidic in ridges and near to neutral in valleys. Organic carbon content, phosphate and potassium are low. Agriculture in this region is mostly rain-dependent. Ground water is not easily and economically tappable. Prevalence of moisture stress on standing Kharif Crop in late monsoon period is very common. In Vindhyan Alluvial Zone, Soil in general are deep, texturally medium fine, mostly acidic in soil reaction, moderately well drained, ground water deeply placed, low in bases, organic matter, phosphate and medium in potassium. Major part of the region harvests more than one crop utilizing canal irrigation system as well as ground water.

### **1.3: TEMPERATURE:**

A maximum of 45°C and a minimum of 10°C temperature are recorded usually.

### **1.4: AVERAGE RAINFALL:**

Ranging from 1100 to 1400 mm, on average.

### **1.5: IRRIGATION:**

About 46% of the net cropped area is under irrigation . The gross cropped area is about 6 lakh ha. and cropping intensity is 147%.

### **1.6: CLIMATE:**

The seasons in Bankura are generally distributed as 'hot summer' (April-May), 'monsoon' (June-September) and 'Cold season' (November-February). The humidity is usually medium to high throughout the year and the rainfall, though not heavy, is usually well distributed. The average annual rainfall to the district is around 1300 mm. The rainy months are generally July and August.

## **1.7: TECHNICAL PROGRAMMES**

### **1.7.1: Village visit and discussion with farmers.**

Neighbouring villages around Ranibandh Block Veterinary Hospital were visited and detailed discussions held with the farmers who are rearing cattle. Majority of the farmers owned 1-6 animals. A few farmers reared large herds of 10-16 animals. Some farmers are also maintaining breeding bulls for natural services, which are allowed for natural service and controlled on

a levy basis Rs. 30-40/- per service. This service still exists predominantly in some villages. Further it was also revealed that the animals, which did not conceive in AI, turned to natural service by the owners. In some cases the animals are taken for grazing during day time in the fields, some farmers gather green grass from the marshy land and cut into pieces and offer to the animals with hay or straw. Palatability of feed is increased through mixing of rice bran and soaked oil cake. Another important feature has been observed, that women are actively involved in rearing of livestock and bringing up young ones to adult hood. They are also involved in other animal husbandry activities. Most of the crossbred animals are reared under intensive system of management.

#### **1.7.2: Gynaeco-clinical examination of representative animals.**

Most of the animals were subjected to gynaeco-clinical examination per-rectally for identifying anestrus, poor estrus, repeat breeding condition and the state of pregnancy. Two hundred and forty owners of the respective villages had 400 female animals, out of these 400 animals 210 and 190 were indigenous and crossbred, respectively. Animals not exhibiting estrus after 36 month of age, in case of indigenous cattle and after 20 months of age in case of crossbred cattle were considered as anoestrous for the purpose of the study. In case of postpartum estrus, 60 days in crossbred and 75 days in indigenous cows were taken as normal gap period. Those failing to exhibit estrus within these period respectively, considered as anoestrus. The reproductive parameters including the age at first estrus in both indigenous and cross bred cattle were evaluated.

The managerial practices and nutritional status of both the cross bred and indigenous cattle were also observed.

### **1.7.3: THERAPEUTIC MEASURES:**

The animals with the problems of anoestrus condition were brought under consideration of the study, leaving out those animals, suffering from infectious conditions, for treatment from the Block Veterinary Hospital.

At first, all the animals were dewormed with Panacur bolus @ 5mg/kg body weight (single dose). Fenbendazole (Broad spectrum anthelmintic, manufactured by Intervet) used as dewormer.

24 animals from indigenous and crossbred cattle each were randomly selected for further treatment.

Animals were divided into 3 groups 8 animals each into Gr. I, II and III

**Group I:** 8 animals were given Min-Vit H (RESPEL PHARMA) one capsule a day for 20 days. It is used as vitamin supplement.

Composition (per capsule):

Copper sulphate-125mg

Cobalt chloride- 10mg

Magnesium sulphate- 20mg

Zinc sulphate-15mg

Ferrous sulphate-30mg

Pottassium iodide-0.5mg

Vit-A- 600 I.U.

Vit-E- 3 I.U.

**Group II:** Weekly tamponing of os-externus with 1% Lugol's Iodine

**Group III:** Weekly massage of the genitalia along with the ovaries, by rectal palpation.

1.7.4: Statistical analysis of data related to age at first service of animals was performed.

1.7.5: Interpretation of results.

#### **1.8: SURVEY ON INFERTILITY**

An extensive survey work was conducted to evaluate the incidence of infertility in the crossbred and indigenous cows maintained by the farmers in rural areas under the traditional animal husbandry practices without providing any balance ration at 8 adopted villages under "The Kangsaboti Milk Producer's Union Ltd, Bankura, WB and eight non-adopted villages of the Bankura district. Survey work with animals, belonging to 240 owners exhibiting infertility problems in these selected villages was conducted. The survey work regarding infertility was carried out during the month of May to August 2008. History of all animals from the respective owners covering the following informations was recorded.

**1.8.1:** Name and address of the owner:

**1.8.2:** Number of cows maintained by an individual:

**1.8.3: Age of calf/calves:**

**1.8.4: Practice of breeding of dam: (N/S or A.I.)**

**1.8.5: Health coverage of the animals:**

**1.8.5.1: Periodical immunization of animals done: (yes/no)**

**1.8.5.2: Regular deworming done: (yes/no)**

**1.8.6: Breeding history, including previous treatment and management Practices:**

**1.8.7: Farmers' observation on estrus cycles and other phenomenon: (like, split estrus)**

**1.8.8: Findings of internal and external examinations:**

**1.8.9: Number of cows/heifers showing infertility problems:**

**1.8.10: Average body weight of the animal:**

**1.8.11: Average age of the animals:**

**1.8.12: Breed of the animals:**

**1.8.13: Lactation performance of the animals:**

# Chapter - 4



## Results and Discussion

# ***RESULTS AND DISCUSSION***

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## **1.1: INCIDENCE OF INFERTILITY**

It is evident from the Table no. 1, that out of 400 animals, 210 and 190 were indigenous and crossbred cows, respectively. Number of indigenous animals suffering from anoestrus, repeat breeding problem and poor estrus were 41 (19.52%), 12 (5.71%), and 3 (1.42) respectively, while in case of crossbred cattle the numbers were 26 (13.68%), 28 (14.73) and 10 (5.26%), respectively for the above conditions.

Out of the 400 cows, 56 (26.66%) indigenous and 64 (33.68%) crossbred cattle were having infertility problems. So, out of total 400 cows, 120 (30.00%) cattle were having infertility problems. Again, total cows in anoestrus, repeat breeding and poor oestrus condition were 67 (16.75%), 40 (10.00%) and 13 (3.25%), respectively.

In this observation, the incidence of total anoestrosity in cattle was lower than that reported by Araujo *et al.* (1975). Whereas, it was higher than that reported by Khan and Luktuke (1967), Naidu and Rao (1981) and Roine and Saloniemi (1978). The incidence of anoestrus condition was in agreement with the observation of Sharma and Luktuke (1983). Further, the incidence of poor estrus was lower (3.25%) than that reported by Zemzanis *et al.* (1969). In this observation the incidence of total repeat breeding condition in cattle was lower (10.00%) than that reported by Kaikini *et al.* (1969) and higher than than that reported by Naidu and Rao (1981) and Roine and Soloniemi (1978). The incidence of repeat breeding condition reported by Gustafson and Emulmuelson (2002) was in

**Table no. 1:** Incidence of infertility (anoestrus, poor estrus and repeat breeding) problems in cows in a few villages of Bankura District.

No. of owners	No. of animals	Percentage of animals with infertility problems			
		No. of animals in anoestrus	No. of animals in repeat breeding	No. of animals in poor estrus	Total
240	Indigenous-210	41 (19.52)	12 (5.71)	3 (1.42)	56 (26.66)
	Crossbred-190	26 (13.68)	28 (14.73)	10 (5.26)	64 (33.68)
	Total-400	67 (16.75)	40 (10.00)	13 (3.25)	120 (30.00)

[The figure in parenthesis indicates the percentage]

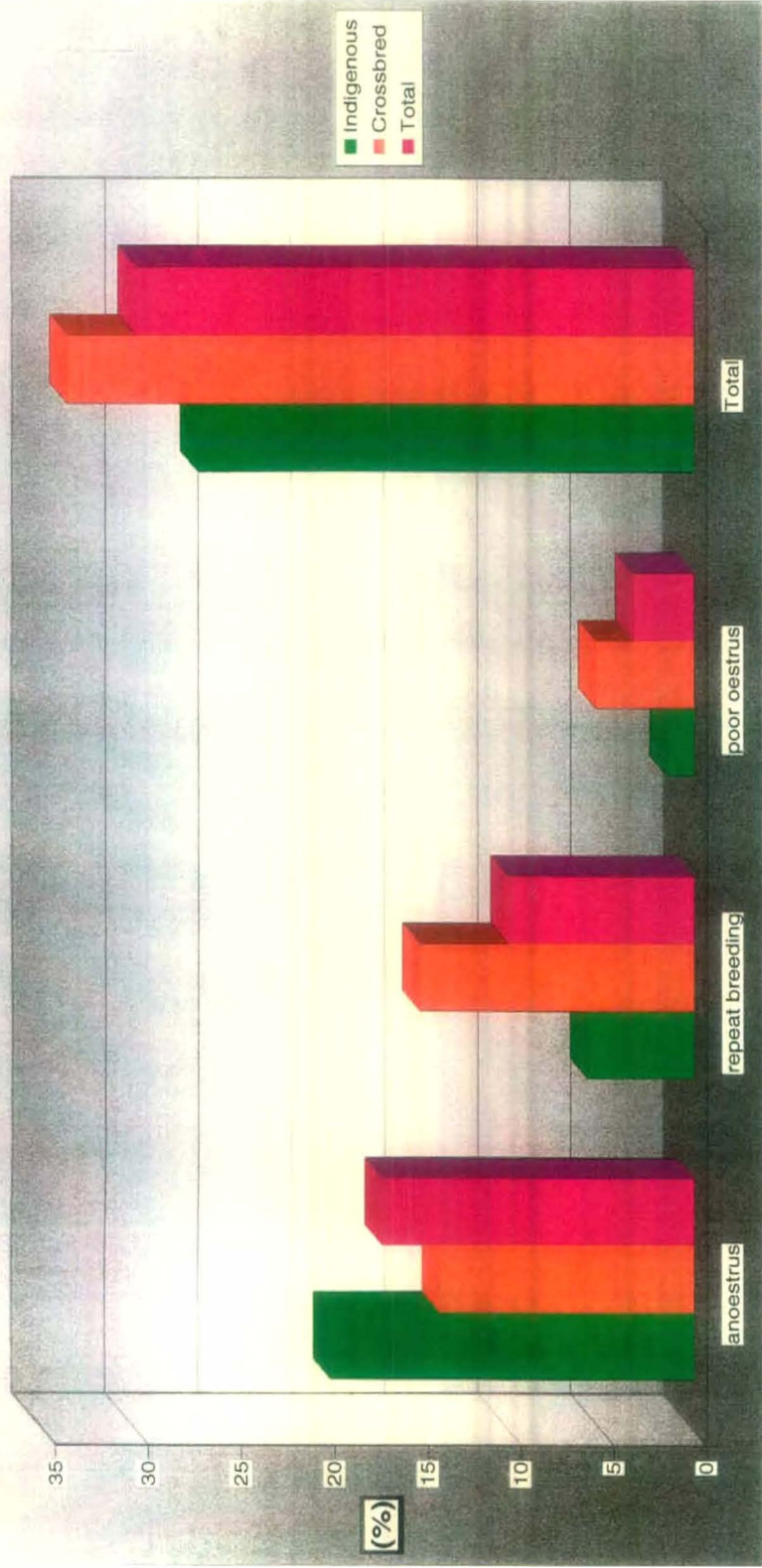


Fig: 1. Showing percentage incidence of infertility incows.

agreement with this present observation. This variation in the incidence of infertility observed by various workers may be due to the variation in the level of inheritance, geographical area of location, environment and management practices, including grazing and other feeding sources etc.

### **1.2: NUTRITION AND MANAGERMENTAL PRACTICES**

In the Table no. 2 showing animals having under nourished condition in indigenous and crossbred cattle were 68 (32.38%) and 83 (43.68%), whereas cows under over feeding condition were 8 (3.34%) and 34 (17.89%), respectively. Again in total animals, under nutritional deficiency and over feeding condition were 151 (37.75%) and 42 (10.50%), respectively.

The present findings corroborated well with the findings of Parker and Blowey (1976), Morrow (1986), Forshel *et al.* (1991) and Fracos *et al.* (1977), who found that nutritional deficiencies or over feeding were major causes of infertility. Herrick (1977) also observed that protein deficiency retards the development of the sex organs and body growth in young animals and affects subsequent reproductive performance.

### **1.3: PERIODICAL IMMUNIZATION & DEWORMING**

In the present work, the Table no. 3 shows that only 29.50%, 27.75% and 27.75% of total animal population (under survey) were under periodical immunization against FMD, BQ and HS, respectively. It was also evident from table 3, that all the animals were under the danger-zone occupied by anthrax and brucellosis as

no animals were found to be under coverage of immunization against these harmful diseases.

The same picture was found in case of regular deworming also, only 42.75% of the total animal population (under survey) was under regular deworming. Most of the animals were not under coverage of regular deworming. It was also found that the owners of the animals who are in the habit of deworming their children regularly, were conscious enough to get the benefit of deworming animals regularly.

Both the pictures regarding immunization and deworming stated above were still below the expected level. Until or unless these obstacles removed, the performance of animal production as well as the reproduction will not be improved. These observations are in agreement with the findings of various workers like Soulsby (1982), Sane *et al* (1982), Chetty and Rao (1986) and Roche *et al* (1992).

#### **1.4: AGE AT APPEARANCE OF FIRST OESTRUS**

In the Table no. 4, it was clearly indicated that the age of the animal at first estrus was more in indigenous (1079.50 days) than in crossbred (779.50 days) animals. In case of indigenous cattle, the present findings were corroborated well with the earlier findings of Rajagopalan (1952); Sane (1982) and Despandey *et al* (2000). The result is higher than the findings of Kumaran (1951); Ahuja *et al* (1961) and Sane *et al* (1968). In case of crossbred cattle, the age at appearance of first oestrus was found to be 779.50 days, which was higher than the findings reported by Roberts (1971); Sane (1982) and Hafez (2000).

This variation in age at appearance of first estrus as observed by various workers and the present observation might be due to the

**Table no. 2: Nutritional deficiency and over feeding based on DCP and TDN value of supplied feed @**

**Morrison's feeding Standards**

No. of owners	No. of animals	No. of animals under nutritional deficiency	No of animals in over feeding
240	Indigenous-210	68 (32.38)	8 (3.34)
	Crossbred-190	83 (43.68)	34 (17.89)
	Total-400	151 (37.75)	42 (10.50)

[The figure in parenthesis indicates the percentage]

**Table no. 3: Animals under coverage of regular deworming and vaccination**

No. of owners	No. of animals	No. of animals under FMD vaccination	No. of animals under B9 vaccination	No. of animals under HS vaccination	No. of animals under anthrax vaccination	No. of animals under brucellosis vaccination	No. of animals under regular deworming
240	Indigenous -210	52 (24.76)	48 (22.85)	47 (22.38)	-	-	58 (27.61)
	Crossbred-190	66 (34.73)	63 (33.15)	64 (33.68)	-	-	113 (59.47)
	Total-400	118 (29.50)	111 (27.75)	111 (27.75)	-	-	171 (42.75)

[The figure in parenthesis indicates the percentage]

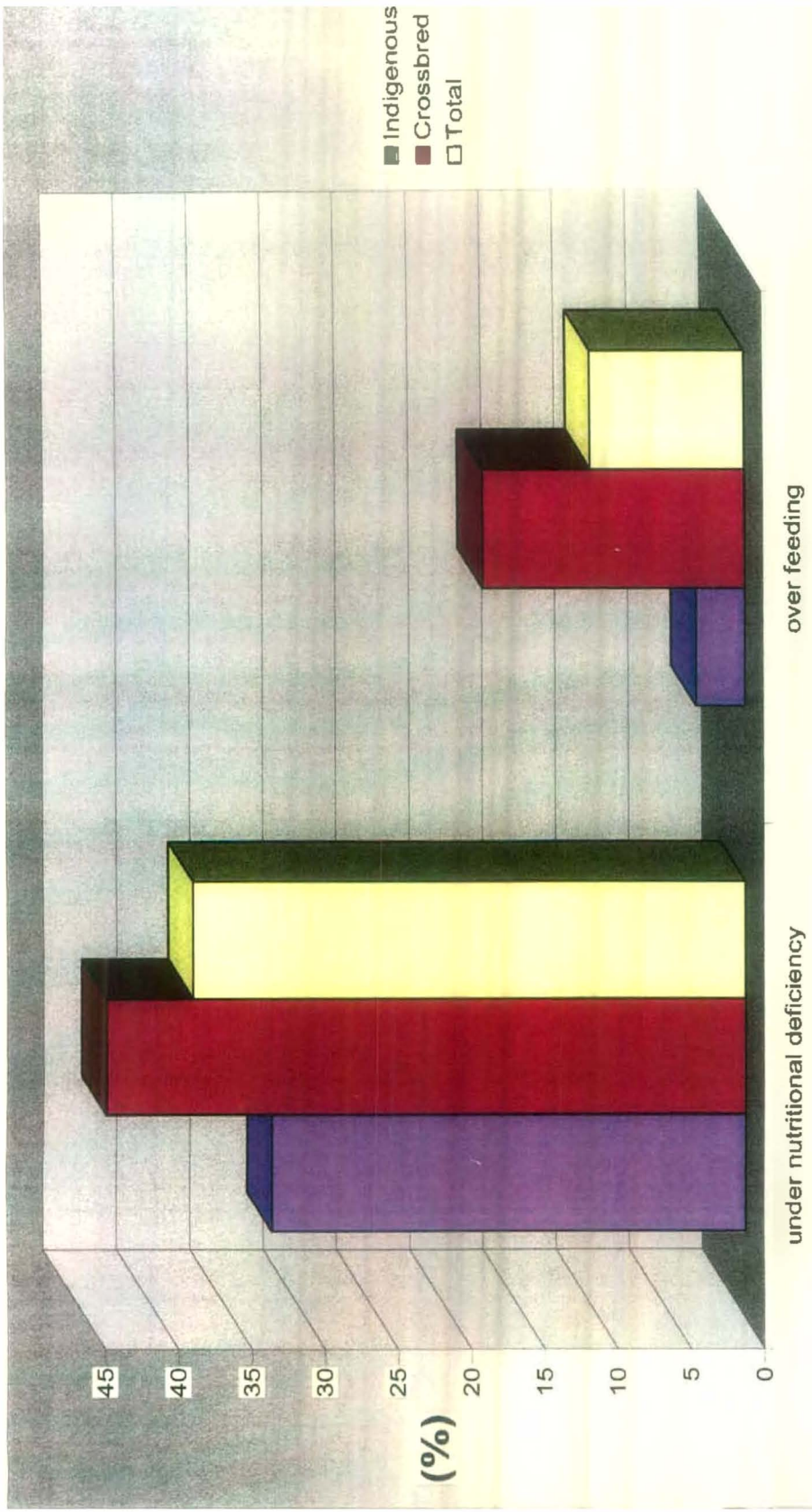


Fig:2. Showing nutritional deficiency & overfeeding condition.

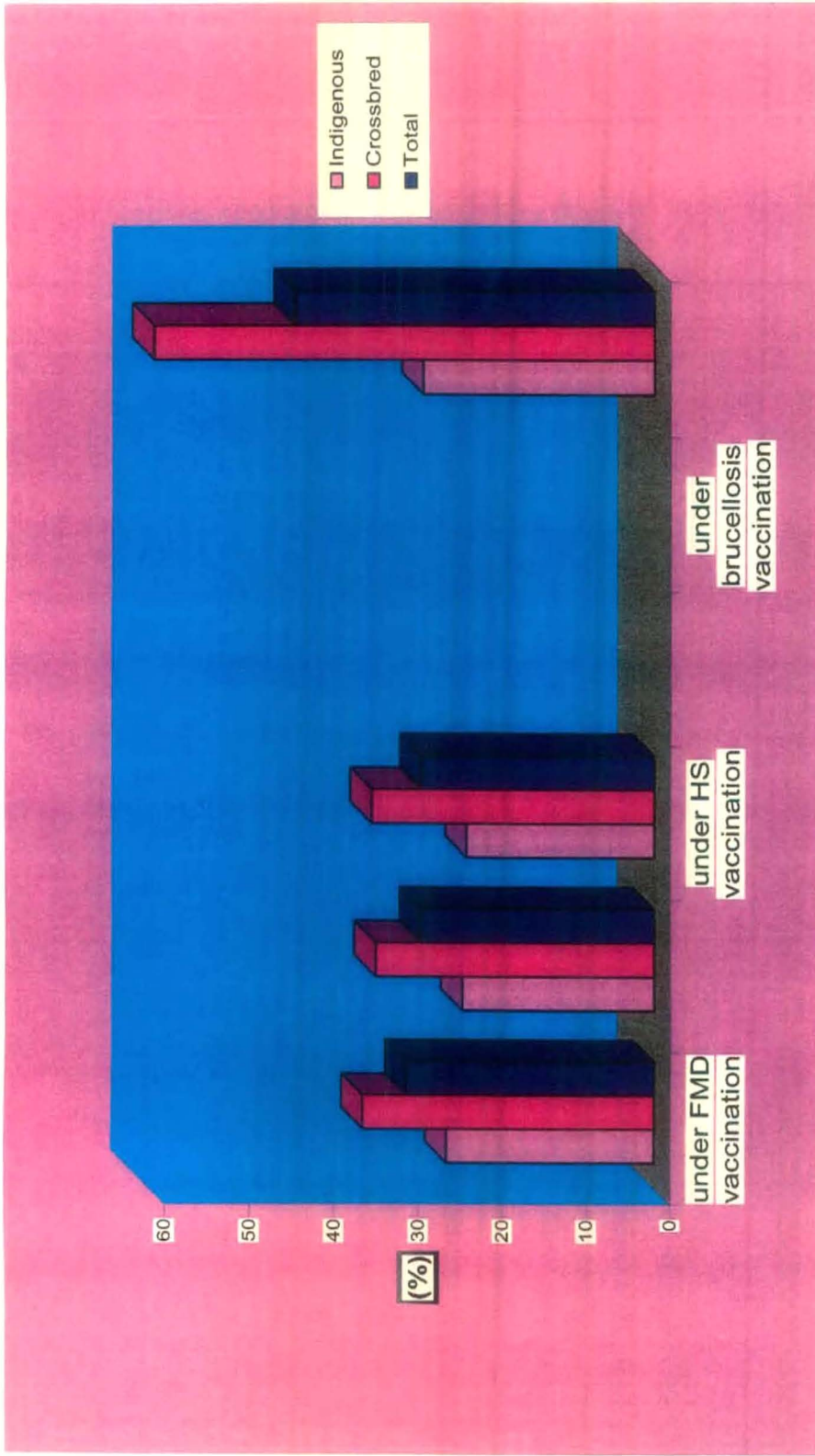


Fig: 3. Animals under coverage of regular deworming and vaccination.

no animals were found to be under coverage of immunization against these harmful diseases.

The same picture was found in case of regular deworming also, only 42.75% of the total animal population (under survey) was under regular deworming. Most of the animals were not under coverage of regular deworming. It was also found that the owners of the animals who are in the habit of deworming their children regularly, were conscious enough to get the benefit of deworming animals regularly.

Both the pictures regarding immunization and deworming stated above were still below the expected level. Until or unless these obstacles removed, the performance of animal production as well as the reproduction will not be improved. These observations are in agreement with the findings of various workers like Soulsby (1982), Sane *et al* (1982), Chetty and Rao (1986) and Roche *et al* (1992).

#### **1.4: AGE AT APPEARANCE OF FIRST OESTRUS**

In the Table no. 4, it was clearly indicated that the age of the animal at first estrus was more in indigenous ( $1079.50 \pm 13.72$  days) than in crossbred ( $779.50 \pm 4.46$  days) animals. In case of indigenous cattle, the present findings were corroborated well with the earlier findings of Rajagopalan (1952); Sane (1982) and Deshpande *et al.* (2000). The result is higher than the findings of Kumaran (1951); Ahuja *et al.* (1961) and Sane *et al.* (1968). In case of crossbred cattle, the age at appearance of first oestrus was found to be 779.50 days, which was higher than the findings reported by Roberts (1971); Sane (1982) and Hafez (2000).

This variation in age at appearance of first estrus as observed by various workers and the present observation might be due to the

variation in the level of inheritance, geographical area of location, environmental effect and managerial practices including grazing and other feeding sources and due to the different types of breeds owned by the farmers.

### **1.5: SEASONAL EFFECT ON REPRODUCTIVE EFFICIENCY**

The probable month of conception was calculated by means of age of the calf in uterus and has been observed that the highest percentage of dams were conceived in the month of May, June and July (44.07%) followed by the months February, March, April (40.11%) and November, December, January (15.82%), respectively, as reflected from the Table no. 5. This result is an agreement with the earlier findings reported by Tiwari and Kuswaha, (1982) and Prasad *et al.*, (2001). When the above parameter was calculated on the basis of pregnancy diagnosis (92-150 days), it has been observed that (38.28%) cow had conceived in the month of December and January followed by the month of July to August (36.72%) and October to November (25.00%), respectively. These results are supported by the earlier findings reported by Dutta *et al.*, (1980); Tiwari *et al.*, (1982); Shrivastava, (1999) and Prasad *et al.*, (2001).

From the above findings it is revealed that the variation of environmental temperature and relative humidity have a definite role in reproductive efficiency as the conception rate has been changed with the change of months as well as seasons. This variation of the effect of season on reproductive efficiency was reported by different workers and the differences of present investigation is mainly due to the variation of environmental temperature and relative humidity,

**Table no. 4:** Mean  $\pm$ SE of values of age at appearance of first estrus in cattle of cross bred and indigenous

Breed	Number of observation	Age at appearance of first estrus (in days)
Cross	11	779.50 $\pm$ 4.46
Indigenous	11	1079.50 $\pm$ 13.72

P significant at 5% lable

**Table no. 5:** Calendar of calf birth

Number of observation	Number of calf (0-90 days)	Number of calf (91-180 days)	Number of calf (181-270 day)
177	44.07% (78)	40.11% (71)	15.82% (28)
Probable month of conception	May, June & July	February, March & April	November, December & January

[The figure in parenthesis indicates the number of calf]

**Table no. 6:** Pregnancy percentage of animals

Number of observation	Pregnancy length (90-150 days)	Pregnancy length (151-210 days)	Pregnancy length (211 to till term)
128	38.28% (49)	25.00% (32)	36.72% (47)
Probable month of conception	December & January	October & November	July & August

[The figure in parenthesis indicates the number of animals]

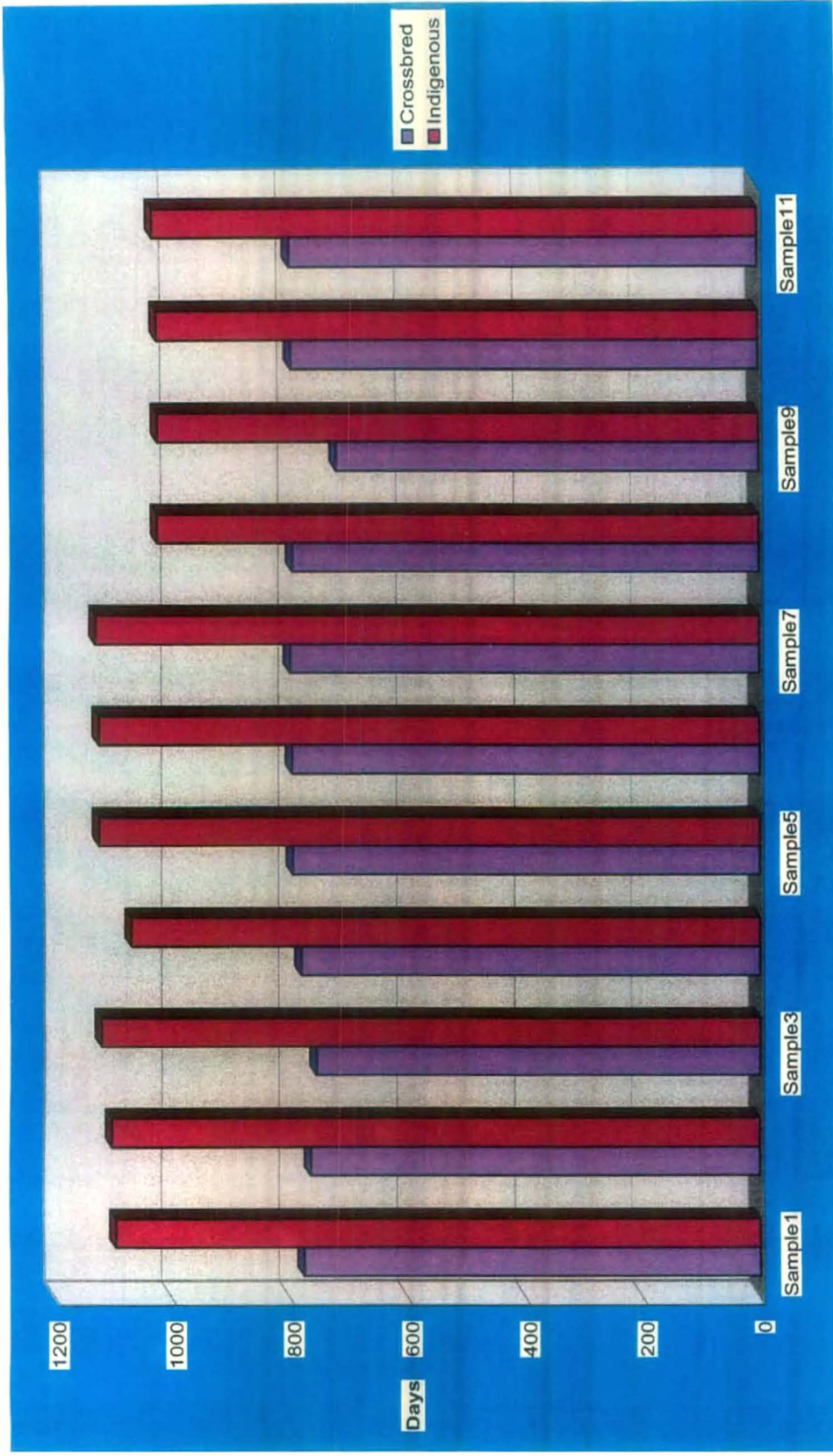


Fig: 4. Showing age at appearance of first service

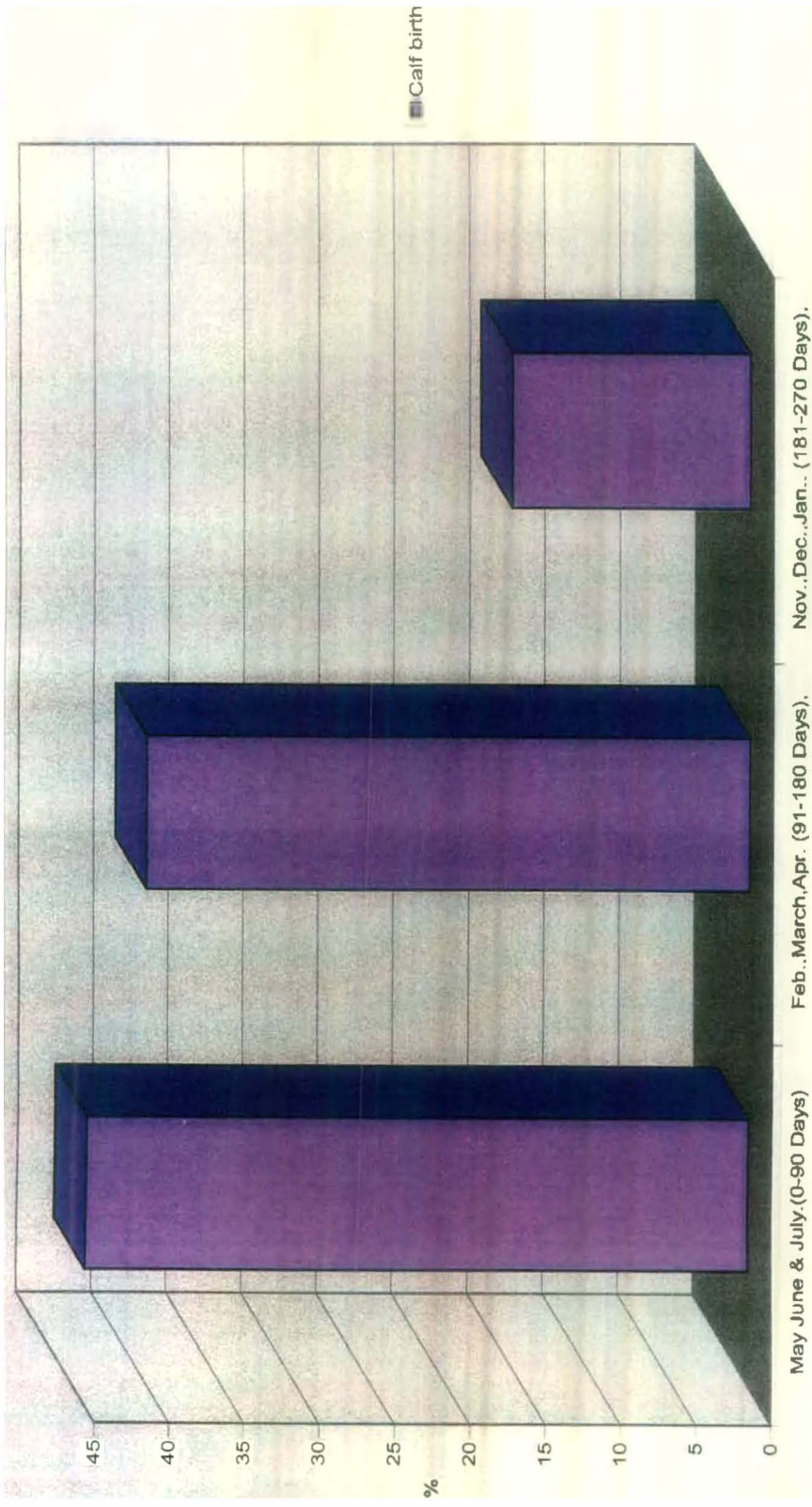


Fig: 5. Showing calendar of calf birth

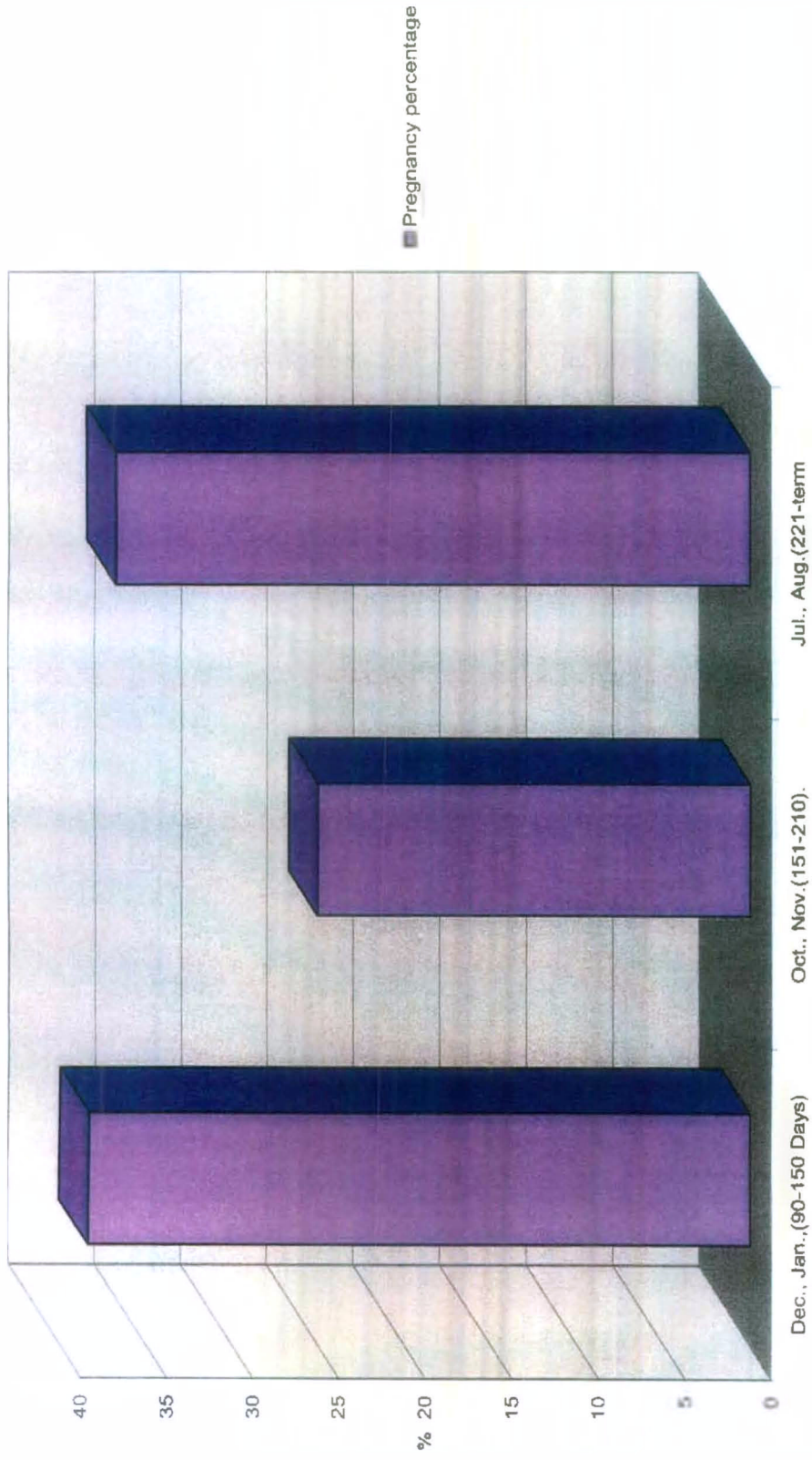


Fig: 6. Showing pregnancy percentage.

geographical location, managerial practices and also the different breeds of cattle.

#### **1.6: PRACTICE OF BREEDING**

Table no. 6 shows that 60.24% cattle were bred by natural service and 39.76% were under AI on calf born basis, while Table no. 6, indicates the trend for increase in number of dams under AI (53.97%). Probably due to introduction of some trained AI workers in this zone this result came to reality, but still it was far behind the satisfactory target.

Although the poor economic status of farmers, literacy, lack of awareness about the modern techniques and the superstition are the great constraints in the way of improving the awareness of farmers, it is likely that if these obstacles are driven out successfully then automatically the reproductive performance of cattle will increase to a great extent and obviously the farmers will be benefited from the contribution of their animals.

#### **1.7: THERAPEUTIC MEASURES:**

In Table no. 7 it was clearly indicated that therapy to the anoestrous cases was undertaken with the Min Vit- H as vitamin mineral supplement. In cases of indigenous and crossbred cattle, positive response was observed in 5 (62.50%) and 6(75.00%), respectively.

Therapy to the anoestrous cases was undertaken with the weekly Lugol's Iodine tamponing of os-externous. In cases of

indigenous and crossbred cattle, positive response was observed in 3(37.50%) and 3(37.50%), respectively.

Therapy to the anoestrous cases was undertaken with weekly ovary massage. In cases of indigenous and crossbred cattle, positive response was observed in 1(12.50%) and 2(25.00%) respectively.

The present findings were closely corroborated with the findings of Das (1991), Sampath and Amritkumar (1984) who recorded gradual improvement of fertility after therapy with mineral supplement.

Again Sarkar (2006) stated that 10 times diluted lugol's Iodine was highly effective than palpative-massage on the ovaries and rupture of mature follicles.

**Table no. 7:** Practice of breeding of dams based on the calf born

Number of observation	Dams under natural service	Dams under AI (Liquid & Frozen semen)
166	60.24% (100)	39.76% (66)

[The figure in parenthesis indicates the number of dam]

**Table no. 8:** Practice of breeding of dams based on Pregnancy

Number of observation	Dams under natural service	Dams under AI (Liquid & Frozen semen)
126	46.03% (58)	53.97% (68)

[The figure in parenthesis indicates the number of cow]

**Table no. 9:** Effect of Mineral mixture and Vitamin supplement, Ovary Massage, Lugol's Iodine tamponing of os externus on Anoestrus in Indigenous and Crossbred cattle

Group	Treatment	Indigenous cattle		Crossbred cattle	
		No. animal treated	No. of animal responded	No. animal treated	No. of animal responded
I	Mineral mixture and Vitamin supplement	8	5 (62.50)	8	6 (75.00)
II	Lugol's Iodine tamponing of os externus	8	3 (37.50)	8	3 (37.50)
III	Ovary Massage	8	1 (12.50)	8	2 (25.00)

[The figure in parenthesis indicates the percentage of cow]



Fig: 7. Showing percentage on ractice of breeding.

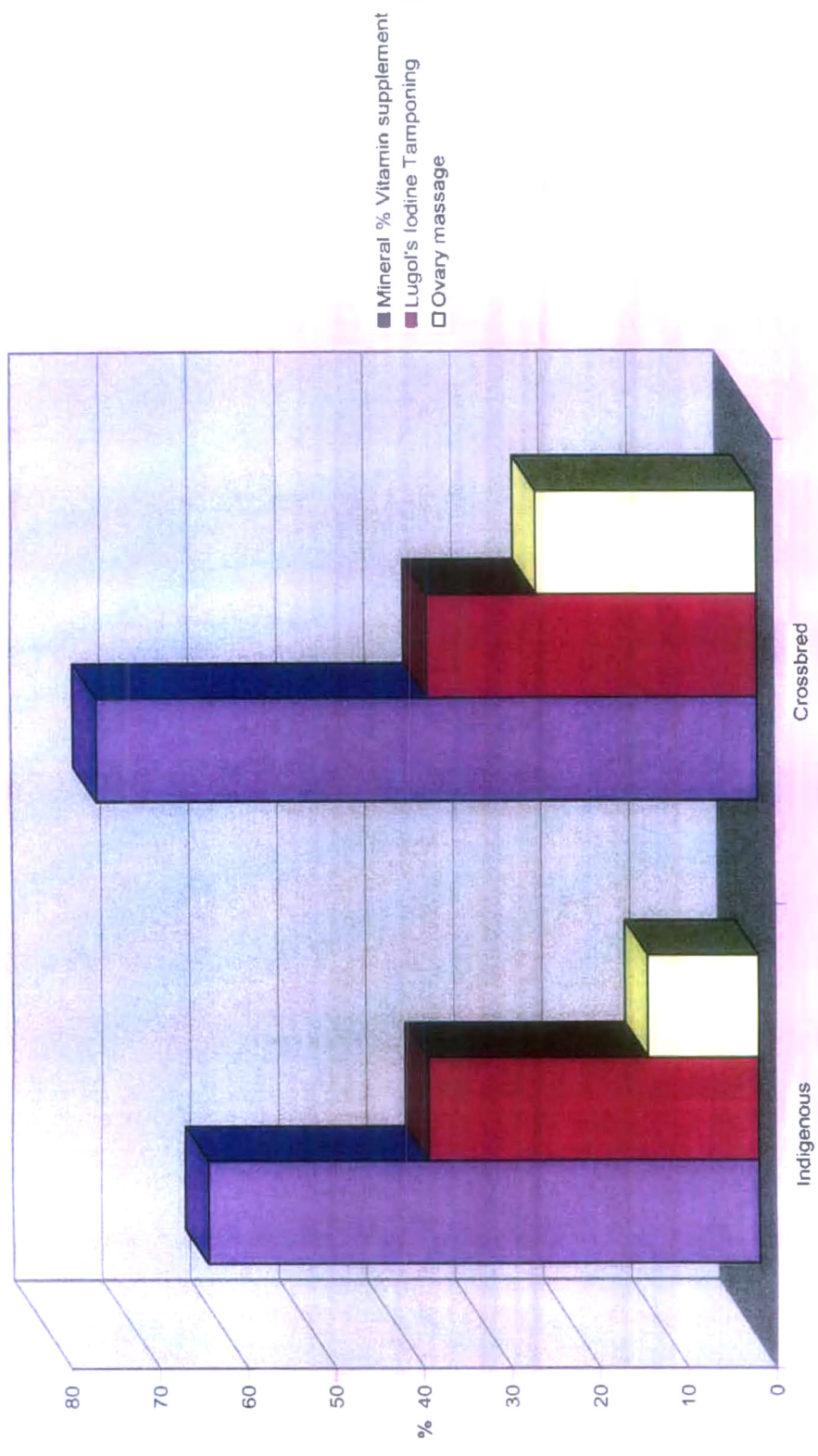


Fig: 8. Showing effect of mineral –vitamin supplementation, Lugol's tamponing of extermous on anoestrus cases.

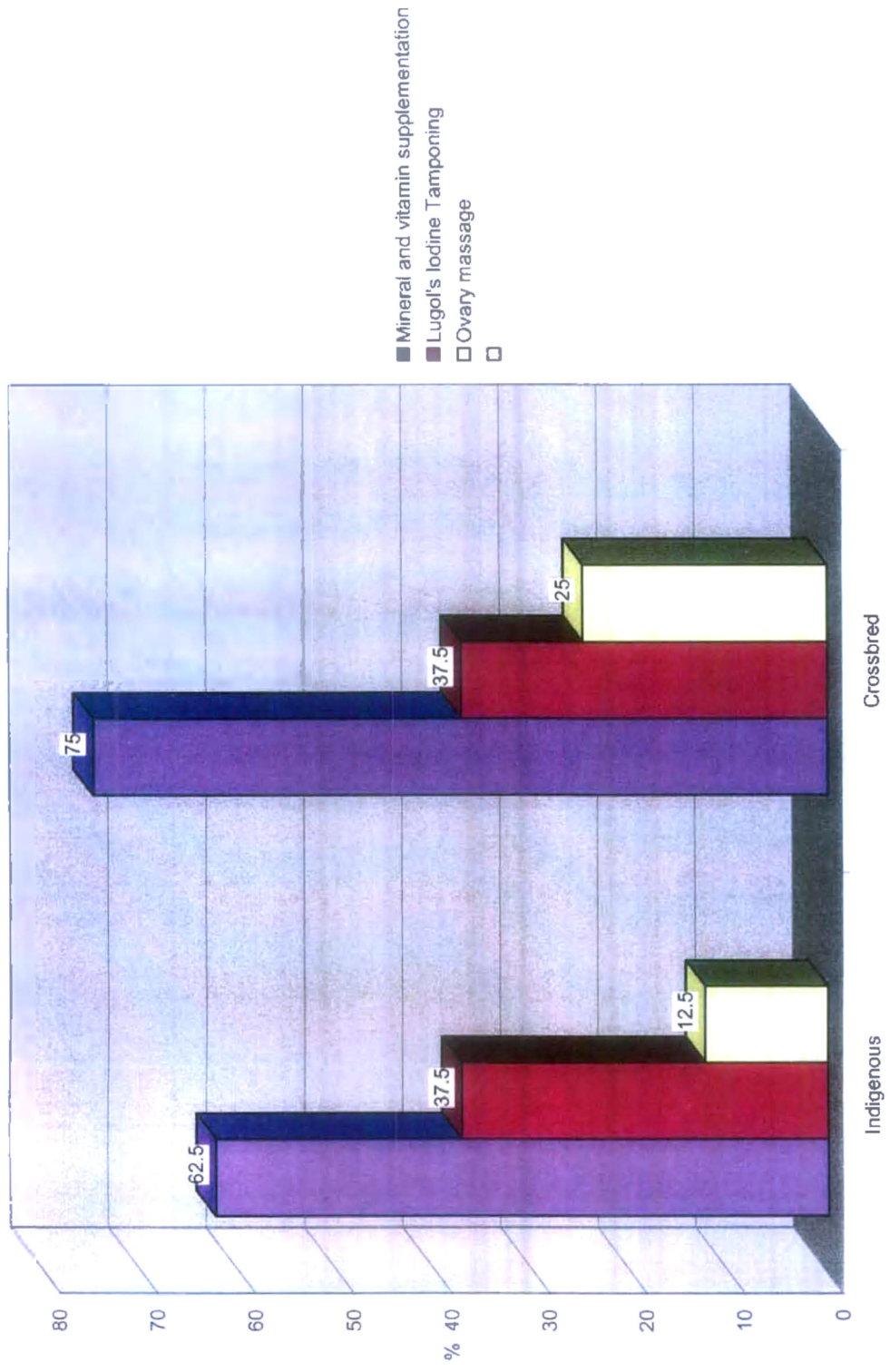


Fig: 9. Showing effect of mineral-vitamin supplement, ovary massage and lugol's Iodine tamponing

# Chapter - 5



Summary and  
Conclusion

## ***SUMMARY AND CONCLUSION***

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Despite of having large population of cattle in India, per capita yield of milk is very less, which is responsible for economical loss to the farmers. A detailed survey and evaluation has been undertaken to make an understanding on the effect of Environmental and managerial causes on various types of infertility with a view to find out easily adoptable measures for improving the breeding soundness of the cattle population. The survey was conducted in eight villages of Ranibandh block of Bankura district, (approx. 60 KM distance from Bankura), India.

Present survey work revealed that, among the villages the distribution of 400 animals including indigenous and crossbred cattle were almost of equal strength, where 26.66% of indigenous cattle and 33.15% of crossbred cattle were found to be suffering from infertility problems. Present study also indicated that 32.38% indigenous cattle and 43.68% of crossbred cattle were being maintained on poor level of nutrition. On the other hand, 3.34% of indigenous and 17.89% of crossbred cattle had a problem of overfeeding.

It is clear from the present study, that only 29.50%, 27.75% and 27.75% of total animal population (under survey) were under the vaccination coverage against infectious diseases like FMD, BQ and HS. The same picture was seen in case of deworming also. Only 42.75% of the total animal (under survey) was under regular deworming. It is observed, that all of the animals were under the danger-zone occupied by anthrax and brucellosis, as no vaccination was done against these two harmful diseases. Regarding the aspect

of technique adopted for the insemination work, it was found that 46.03% of animals were under natural service and 53.97% animals were inseminated artificially. Previously the percentages were 60.24% and 39.76%, respectively.

In this survey work it has been revealed, that average age of animals at appearance of first estrus in case of crossbred animals was 779.50 days and in case of indigenous cattle, it was 1079.50 days. Present survey also clearly indicates that the conception rate of cows differed with the change of months as well as seasons.

## **CONCLUSION**

In our rural Bengal, the cattle plays a significant role in the socio-economic development of the mass. Successful reproduction in cows with birth of young ones is an essential need of animal husbandry for development. Hence the acquisition of knowledge on science of reproduction is essential to make the animal husbandry practice a profitable one. There are many components of successful reproduction. Any aberration in any of the areas causes failure in reproduction and resulting into a loss. The failure in the development of endocrine competence is a major problem in infertility. This incompetence may arise from poor management, low plain of nutrition and metabolic disorder, at prenatal and post-natal stages. The reproductive diseases are caused by bacteria, virus, protozoa and other factors also affect the reproductive success to a large extent. Considering the above fact in view, we planned to make a survey in cattle population in eight villages of Bankura district, which is covered by red laterite soil and having different environment than other districts of this state. A part of the area

under survey falls under the care and management of the Kangsabati Co-operative Milk Producer's Union Limited. The survey reveals a large percentage of infertility in cattle was perhaps accentuated due to unawareness of the farmers of their livestock animals vis-a-vis poor managerial practices and low plain of nutrition, coupled with defective timings of A.I., non treatment of reproductive disorders in time etc.

Comparative therapeutic study revealed that mineral and vitamin supplementation has better efficacy in improvement of anestrus cases compared to ovary massage and weekly tamponing of os-externus with 1% Lugol's Iodine.

It was also evident from the present study that persons, who are conscious about their family health, became more convinced and adopted Animal Husbandry practices with much interest to get more benefit out of it.

# Chapter - 6



Future Scope of  
Research

## ***FUTURE SCOPE OF RESEARCH***

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1. As it has been mentioned earlier that the state has been divided into six different zones, according to the nature of soil and agro-climatic conditions. The present work was a sample survey in red-laterite zone. Some other workers surveyed on alluvial zone also. However, it would be better if an intensive work is undertaken for all the six zones so that the different problems of infertility could be surfaced and corrective measures could be taken up accordingly.

2. It was revealed under the present study that supplementation of vitamins and minerals with animal feed could be of value to improve the reproductive performance of the animals. Since the different zones of W.B. are having soil constituents and as the whole process depends much on soil-plant-animal relationship, farmers of the different zones could be advised to mix different fertilizers and additives as per requirement, on the basis of soil analysis.

3. A large portion of the infertile animals were not included in the present study as they were showing infectious causes of infertility. It would be very much effective, if such cases are also taken into consideration for study and detailed biochemical and micro-biological parameters are evaluated in future.

# *Bibliography*

## ***BIBLIOGRAPHY***

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- Ahuja, L. D., Luktuke, S. N. and Bhattacharya, P. (1961). Certain aspect of physiology of Reproduction in Haryana females. *Indian. J. Vet. Sci.*, **31**(14): 13-14.
- Araujo, P. G., Pizelli, G. N., Carvalho, M. R. D., Rosende, O. D., Britto, D. P. (1975). Studies of postpartum anoestrus in cattle. *Abs. Vet. Bull.*, **45**: 284.
- Bandinga, L., Colleir, R. J., Thatcher, W. W. and Wilcox, C. J. (1985). Factors affecting breeding efficiency in dairy cattle. *J. Dairy sci.*, **68**: 78.
- Banerjee, G. C. (1998). A text book of animal husbandry. 8<sup>th</sup> ed. Oxford and IBH Publishing Co. Pvt. Ltd. pp: 287, 666.
- Blanchard, T. J., Ferguson, L., Love, T., Tekeda, B., Handerson, J. and Halser, W. (1990). Effect of dietary crude protein type on fertilization and embryo quality in dairy cattle. *Anim. J. Vet. Res.*, **51**: 905.
- Boland, M. P. (2002). Impact of current management practices on embryo survival in the modern dairy cow. *Cattle practice.*, **10**(4): 337-347.

- Breastansky, L., Kazer, L., Kizak, M., Balascak, J., Kavasnak, M. and Fabain, A. (1977). Nutrition of dairy cows in relation to reproductive disorders. (*c.f. Anim. Breed.* **45**(10): 5940.)
- Chaney, R. L. (1993). Zinc Phytotoxicity. Zinc in soils and plants . Kluwer academic press. Dordrecht, The Netherlands. pp. 135-150. (*c.f. Proceedings of Alltech's 16<sup>th</sup> Annual Symposium*).
- Chetty, A. V. and Rao, A. R. (1986). Levels of blood constituents in anoestrus condition. *Livestock advisor.*, **11**(6): 34-35.
- Das, K. C. (1991). Studies on soil-plant relationship in respect of micronutrients of Midnapore district, West Bengal. M.V.Sc. Thesis submitted to B.C.K.V.
- Despande, B. R. and Sane, C. R. (1977). Prolonged post-partum anoestrus condition in cows. *Indian Vet J.*, **54**(1): 63-68.
- Despande, K. S., Mitkari, K. R. and Siddiqui, M. F. (2000). Reproductive status of Deoni cattle in Maharashtra. Seminer on Potential & Prospects of Applied Reproduction Biotechnology in Indigenous cattle and Buffaloes in the coming millennium. pp: 26.

- Dutta, J. D., Kakati, B. N., Rajkonwar, C, K. and Bargohain, B. N. (1980). Seasonal variation in breeding efficiency of farm cattle. *Indian Vet. J.*, **57**: 225.
- Forcell, K. P., Anderson, L. Pehrson, B. (1991). The relation Between the fertility of dairy cows and clinical biochemical measurements, with special reference to plasma glucose and acetone. *Journal Vet. Medicine.*, **38**: 608-16.
- Francos, G., Davidson, N. and Mayer, E. (1977). Influences of some nutritional factors on incidence of repeat breeder syndrome in high producing dairy herds. *Therigenology.*, **7**: 105-111.
- Fraser, C. M., Bergeron, J. A., Mays, A.S.A. and Aiello, S. E. (1991). Nutritional diseases of cattle and sheep in 'The Merk Manual'. 7<sup>th</sup> ed. Merk and company. Inc. Rahway, N. J., U.S.A.
- Gangwar, P. C., Branton, C. and Evans, D. L. (1965). Reproductive and Physiological responses of Holstein heifers to control and Natural Climatic conditions. *J. Dairy Sci.*, **48**(2): 222.

- Grewal, A. S., Abhi, H. L. and Nagpal, M. P. (1974). A study on the effect of month and season upon the breeding efficiency of Haryana cows with artificial insemination under farm management. *Indian J. Dairy Sci.*, **27**: 54-57.
- Gustafson, H. and Emanuenson, U. (2002). Characterization of repeat breeding syndrome in Swedish dairy cattle. *Acta-Veterinaria-Scandinavica.*, **43**(2): 115-125.
- Hafez, E. S. E. and Hafez, B. (2000). Reproduction in farm animals. 7<sup>th</sup> ed. Lippincott Williams & Wilkins. Philadelphia. **57**: 261-273.
- Herrick, J. B. (1977). External factors affecting reproduction in dairy cattle. First all India Symp. Anim. Reprod. Punjab Agri. Univ. Ludhiana.
- Hillen J. M. and Rupel, I. W. (1960). Different effect of season on conception rate in Holstein and Jersey cattle. *J. Dairy Sci.*, **43**(3): 442.
- Hidiroglou, M. (1979). Trace element deficiencies and infertility in ruminants a review. *Indian J. Dairy Sci.*, **62**: 1195-1206.
- Hidiroglou, M. (1980). Manganese in ruminant nutrition. *Can. J. Anim. Sci.*, **60**: 579.

- Humphries, W. R., Philippo, M., Young, B. W. and Bremmer, I. (1983). The influence of dietary Fe and Mo on Cu metabolism in calves. *Br. J. Nutri.*, **49**: 47.
- Kaikini, A. S., Chikhalikar, G. K. and Dindorkar, C. V. (1981). Reproduction disorders in Jersey × Gir F<sub>1</sub> crossbred cows. *Indian J. Anim. Reprod.*, **1**(1): 39-42.
- Kelly, J. W. and Hurst, V. (1963). The effect of season on the fertility of the dairy bull and dairy cow. *J.A.V.M.A.*, **143** (1): 40.
- Khan, B. W. and Luktuke, S. W. (1967). Studies on the incidence of anoestrus and repeat breeding in Haryana cows. *Indian Vet J.*, **44**: 678-683.
- Kolb, E. (1959). Die Debutung des magnas in der tierernahrung, *Tieraerzt. UM.* **14**: 265. [c. f. Hidioglou, M. (1979) Trace element deficiencies and fertility in ruminants. A review. *J. Dairy Sci.*, **62**: 1195-1206].
- Kumaran, J. D. S. (1951). Artificial Insemination and Animal Production. Pub. S. Bhattacharya and Co. (cal). pp: 349.
- Lucy, M. C. (2001). Reproductive loss in high producing dairy cattle. Where will it end? *J. Dairy Sci.*, **84**(6): 1277-1293.

- Luktuke, S. N. and Sharma, C. (1978). Studies on the incidence of 'True Anoestrus' in rural cattle and buffaloes. *Indian Vet. J.*, **55**(12): 940-942.
- McDowel, L. R., Conrad, J. H. and Henry, F. G. (1993). Minerals for grazing ruminants in tropical regions, 2<sup>nd</sup> ed., centre for tropical agriculture, University of Florida, Gainesville. pp: 53-55.
- McDowel, L. R., Conrad, J. H. and Loosli, J. K. (1986). Paper presented at International Symposium on the use of nuclear techniques in studies of animal Production and health in defferent environments. Viena, Austria (FAO-IAEA-SM-292/25).
- Metheker , K. W., Despandey, A. D. and Despanday, K. S. (1992). The productive and breeding efficiency of Jersey cows . *Indian J. Anim. Sci.*, **62**(2): 173-174.
- Morrow, D. A. (1986). Effect of reproduction in dairy cattle, in: current therapy in Theriogenology, 1<sup>st</sup> ed., pub by W.B. Saunders company, Philadelphia. pp: 31.
- Naidu, K. V. and Rao, A. R. (1981). Incidence of infertility among crossbred cattle of Andhrapradesh. *Indian J. Anim. Sci.*, **51**(9): 829-831.

- Nivsarkar, A. E. (2000). Current profile of National animal resources of India with special reference to Indigenous cattle and buffaloes. Seminar on potential and prospects of applied reproduction biotechnology in indigenous cattle and buffaloes in coming millennium. pp: 153-154.
- Parker, B. N. J. and Blowey, R. W. (1976). Investigations into the relationship of selected blood components to nutrition and fertility of the dairy cows under commercial farm conditions. *Vet Rec.*, **99**: 394-404.
- Prasad, M., Tiwary, R. P. and Singh, C. (2001). Seasonal variation in Reproductive efficiency of Sahiwal cows. *Indian. J. Anim. Reprod.*, **22**: 86-87.
- Purbey, L. N. (1965). A composite study of Dangri herd of cattle with specific reference to certain aspects of Physio-pathology of Reproduction . *Indian. J. Vet. Sci.*, **32**(4):271-275.
- Rajgopalan, V. R. (1952). Preliminary statistical study of the Sindhi & Kangayam breeds at L.R.S. Hosur. *Indian. Vet. J.*, **38**(4) 293-306.
- Reddy, R. Y. S. and Reddy S. M. (1988). Interrelationship of some biochemical constituents in the blood serum for fertile and infertile cows. *Mysore Journal of Agricultural Science.*, **22**: 359-362.

- Roberts, S. J. (1971). *Veterinary Obstetrics and Genital diseases*.  
2<sup>nd</sup> ed. Theriogenology. CBS publishers and distributors  
(India). pp : 353, 356, 824-826.
- Roche, J. F., Crowe, M. A. and Boland, M. P. (1992). Postpartum  
anoestrous in dairy and beef cows. *Animal Reprod. Sci.*,  
**28**: 371-378.
- Roine, K. and Salonieemi, H. (1978). Incidence of infertility of dairy  
cows. *Acta Veterinaria Scandinavica.*, **19**(3) : 354-367.
- Sarkar, A. K. (2006). Therapeutic Management of Anoestrus Cows  
with Diluted Logul's Iodine and Massage on Reproductive  
Organs-uncontrolled Case Study. *Research Journal of  
Animal and Veterinary Sciences.*, **1**(1): 30-32.
- Sampath, S. R. and amrithkumar, M. N. (1984). Mineral  
supplements for improved performance of dairy animals.  
*Proc. Symp. Rec. Adv. Min. Nutr.*, pp: 38-44.
- Sane, C. R., Kaikani, A. S., Despande, B. R., Desai, V. G. and  
Koranne, G. S. (1968). Studies made during  
investigations of problems of Gynaecological importance  
under cattle sterility scheme , Bombay state, Nagpur  
Vety. College Mag. **6**: 143-153.
- Sane, C. R., Despande, S. P., Despande, B. R. and Kaikini, A. S.  
(1958). Herd infertility in Gir cattle due to copper  
deficiency. *Indian Vet J.*, **35**: 154-161.

- Sane, C. R. (1982). A Text Book of Reproduction in Farm Animals. Theriogenology. Varghese Publishing House (Mumbai)., pp: 178, 776-777.
- Schawarz, F. J. and Kirchgessner, M. (1978). Copper and Zinc contents in milk and plasma of cow given large supplements of copper, *Zeitschrift für Lebensmittel, Untersuchung and Forschung.*, **166**(1): 5-8. [c. f. Nutr. Abst. Review Series B. **48**(9): 5313].
- Sharma, C. and Luktuke, S. N. (1983). Studies on the incidence of Infertility in rural cattle and buffaloes. *Indian Vet. J.*, **52**(9): 88-93.
- Singh, S. K. and Pandey, R. S. (1970). The effect of season and year of calving on the economic traits of Haryana cows in Bihar. *Indian Vet. J.*, **93**: 992-997.
- Sing C. M. (2000). Importance of the small holders in the conservation of the animal genetic biodiversity in India. Seminar on potential and prospects of applied reproduction biotechnology in indigenous cattle and buffaloes in coming millennium. pp: 2.
- Sing, C. S. P., Sing S. K. and Sing, B. (1981). Studies on the incidence of infertility in cows. *Ind. Vet. J.*, **58**(11): 909-912.

Soulsby, E. J. L. (1982). Helminthes, Arthropods and protozoa of domesticated animals. 7<sup>th</sup> ed. Pub. ELBS and Bailliere Tindal, London.

Sreemannarayana, O. and Narashima Rao, A. V. (1997). A comparative study of infertility of crossbred cows and buffaloes under village Management. *Indian J. Anim. Reprod.*, **18**(1): 46-47.

Srivastava, S. K. and Sahani, K. L. (1999). Effect of season on oestrus and conception in village cows and buffaloes. *Indian J. Anim. Sci.*, **37**(2): 78.

Taneja, V. K., Nagarcenkar, R. and Bhat, P. N. (2002). Cattle and buffalo breeding. In: Hand book of animal Directorate of information and publications of agriculture, Indian Council of Agricultural Research, New Delhi, pp: 2.

Tiwari, R. P. and Kushwaha, N. S. (1982). Effect of season of calving on service period and season of calving on service period of Sahiwal cows and Murrah Buffalo. *Indian J. Anim. Reprod.*, **2**(1): 34-36.

Underwood, E. J. and Suttle, N. F. (1999). The mineral Nutrition of Livestock. 3<sup>rd</sup> ed. pp. 37.

VanHarden, S. (1963). Aspect of tropical and subtropical infertility and Livestock infertility. *Animal Health Monograph*, 5, FAO, Rome, 78.

Velhankar, D. P. (1973). Growth, Puberty, Sexual maturity in Gir heifers consequential to different dietary energy levels with critical studies on blood glucose, copper, cholesterol and haemoglobin polymorphism. *Indian Vet. J.*, **39**: 362.

Zemjais, R., Fining, M. L. and Schultz, R. H. (1969). Anoestrous, The practitioners Dilemma, *Vet. Scope (Upjohn)*., **14**: 1-14.