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# Comparative study on conception rate in indigenous and crossbred cows after artificial insemination

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## ABSTRACT

Objective was to make a comparative study in conception rate (CR)) of cows after artificial cows. The study was carried out in Kushtia district, Bangladesh. Three hundred and fifty cows were examined during the study period of one year (2011-2012) brought to different artificial insemination (AI) points. The experimental animals were within zero to 7$^{th}$ parity and they were inseminated artificially through using the semen from different bulls of 3 genotypes. The study revealed that the overall conception rate is 62.86%. In different breed groups, conception rate was highest (69.23%) in native cattle and intermediate (67.92%) in Sahiwal cross and lowest (57.22%) in Friesian cross. In different age groups conception rate was highest in between 4-5 years, 72.31-70.51% and lower in the animals with 9 years or above. Cows with aged group more than 9 years had significantly decreased conception rate. In different parity, conception rate was higher in both parity 3 and 4 with conception rate was 79.63 and 75.00% respectively and declined from 6$^{th}$ parity gradually. The service per conception was lowest (1.44) in local cow, intermediate (1.47) in Sahiwal cross and highest (1.75) in Friesian cross. The lower service per conception is a desirable merit in breeding of animals. More service was required for heifer than older animals. All together the data demonstrated that breed of cows at differ age and parity has considerable effect on conception rate. To achieve the desire rate of conception, farmer should inseminate their cows considering the age and parity of the cows.

**Key words:** Conception rate, artificial insemination, indigenous, crossbred, cow, Bangladesh.

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## INTRODUCTION

Getting cows pregnant in a timely manner is important in maintaining a profitable dairy business. Reproductive performance in dairy cows has declined over the last 25 years in dairy cows, with an increased number of days open and decreased conception rates (Silvia, 1998). In Bangladesh, artificial insemination (AI) was introduced as an effective breeding program beginning of 1960 by Central Cattle Breeding Farm, Dhaka with the objective of upgrading indigenous local cows. Latter, a cross breeding program was planned for upgrading the local cattle with the infusion of *Bos taurus* blood. AI program always demands to keep records of non-return rate, conception rate, service per conception and calving rate in order to properly evaluate the reproductive efficiency of cows, skillness of the inseminators, fertility and semen quality of bulls. However, an effective reproductive recording system must provide the cattle owner with the key information required to make reproductive management decision. Ideally, optimum economic fertility could be achieved with a pregnancy rate of 80% after the first insemination, a maximum of

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1.3 services per conception and an average interval of 85 days between parturition and conception (Morrow, 1980).

Conception rate is directly associated with the production attribute and responsible for monitoring life time productivity of the individual animal. Conception is the first pre-requisite of an animal entering into the productive life. Conception rate determines directly to the total profitability of farm enterprises. Thus, to achieve the maximum profitability, it is very important to increase the conception rate up to maximum level. On the contrary, there are many genetic and non-genetic factors, viz. genotypes of cow, genotype of bull, age and parity of cow, semen quality etc., have direct influence on increasing conception rate (Kathy, 2004). Considering these, the present study was aimed to make a comparative study on conception rate of cows in Kushtia district in order to recommend optimum approach for maximum conception rate.

## MATERIALS AND METHOD

### Study area

The experiment was conducted at different artificial insemination center (AI), Kushtia, Bangladesh for a period of January 2011 to December 2012 with 350 cows of 3 different genotypes.

### Experimental animal

The animals were of 3 to 12 years aged and within zero to 7$^{th}$ parity. The age and parity were recorded according to their own statement and also using by dental formulae. Most of the animals were indigenous Zebu type and besides these the crossbreds Friesian cross and Sahiwal cross were available under the experiment. The overall feeding and management of the animals was almost similar and these are kept by the farmers with stall feeding and grazing.

### Artificial insemination

When the farmers brought their animals to the AI centers, the reproductive status and estrus condition of the animals were checked and determined by observing the clinical signs and if it is necessary, by using vaginal speculum for examining the condition of cervix. Artificial insemination was done after a variable period of signs of estrus, ranging from 12 h to 18 h, by trained AI technician with thawed semen straw. Three types of semen were used for AI in the present study, which were collected from bulls of three genotypes (Local X Sahiwal; Local X Friesian; Sahiwal X Friesian).

Cows which were brought from rural area inseminated with the semen of Local X Sahiwal and which were brought from semi urban and urban area were inseminated with the semen of Friesian Cross.

### Conception rate and service per conception

Conception rates (CR) were estimated from the proportion of pregnancies confirmed by the rectal palpation of the genital tract at day 60 of post insemination among the total number of cows /heifer inseminated artificially with frozen semen in a specified period of time. The results of the pregnancy diagnosis were recorded to find out the conception rate. The pregnancy was confirmed by observing the asymmetry of the horn, palpation of the fetus and slipping of the fetal membrane.

$$\text{Conception rate \%} = \frac{\text{Number of cows pregnant}}{\text{Numebr of cows inseminated}} \times 100$$

$$\text{Service per conception} = \frac{\text{Total number of service}}{\text{Total number of cow conceived}}$$

## RESULTS AND DISCUSSION

The total conception rate and the variation in relation to different age, breed and parity groups are shown in Table 1, 2, 3. The total conception rate was 62.86% which was in agreement with Bhatnagar et al. (1978). This rate was higher than those reported by Nair (1975).

### Conception rate in different breeds of cow

The highest (69.23%) conception rate (CR) was observed in indigenous local cows and lowest

(57.22%) in Friesian cross, but there was no considerable variation in conception rate among the different genotypes of cows (Table 1). These results is in accordance with the study of Gosh, 1995), and Gwazdauskas et al. (1975). But Rao et al. (1992) observed significantly higher CR of indigenous cows than other genotypic groups. The uses of quality frozen semen with efficient AI technique can minimize the effect genotype on conception rate. However other factors like environmental and management conditions might have more influence on fertility.

Table 1
Conception rate in different breeds of cows in Kushtia district.

| Breed | No. of cows inseminated | No. of cows conceived | Conception rate (%) | Service per conception |
|---|---|---|---|---|
| Local | 117 | 81 | 69.23 | 1.44 |
| Friesian cross | 180 | 103 | 57.22 | 1.75 |
| Sahiwal cross | 53 | 36 | 67.92 | 1.47 |
| Total | 350 | 220 | 62.86 | 1.59 |

Table 2
Conception rate in different parity of cows in Khustia district.

| Parity | No. of cows inseminated | No. of cows conceived | Conception rate (%) | Service per conception |
|---|---|---|---|---|
| 0 | 65 | 32 | 49.23 | 2.03 |
| 1 | 62 | 35 | 56.45 | 1.77 |
| 2 | 87 | 57 | 65.52 | 1.53 |
| 3 | 54 | 43 | 79.63 | 1.26 |
| 4 | 32 | 24 | 75.00 | 1.33 |
| 5 | 23 | 17 | 73.91 | 1.35 |
| 6 | 15 | 7 | 46.67 | 2.14 |
| 7 | 12 | 5 | 41.67 | 2.4 |

Table 3
Conception rate in different age group of cow in Kushtia district.

| Age group(Years) | No. of cows inseminated | No. of cows conceived | Conception rate (%) | Service per conception |
|---|---|---|---|---|
| 3 | 56 | 31 | 55.36 | 1.81 |
| 4 | 65 | 47 | 72.31 | 1.38 |
| 5 | 78 | 55 | 70.51 | 1.42 |
| 7 | 75 | 46 | 61.33 | 1.63 |
| 8 | 53 | 31 | 58.49 | 1.71 |
| >9 | 23 | 10 | 43.48 | 2.3 |

Table-4
Frequency distribution of service and conception.

| Variable | Category | No. of observation | No. of cow conceived | Conception rate (%) |
|---|---|---|---|---|
| Service | 1-2 | 300 | 195 | 65 |
| | 3-rest | 50 | 25 | 50 |

**Conception rate in different parity of cows**

The first service conception rate was studied from zero to 7th parity. The CR was increased up to 3rd parity and then decreased up to last parity (Table 2). Bhagat and Gokhale (1999) also reported similar results that CR increased gradually from the 1st parity to the 4th parity and then decreased in the subsequent parities. Xu Fengxum (1997) observed higher CR in 1st, 2nd and 3rd parities than in later parities. Biochard and Manfredi (1994) reported that the CR in 1st parity of cows was highest (56.45%) and the lowest in 7th parity of cows (41.67%). The result showed that the conception rate is maximum in 3rd parity and minimum in 7th parity of cow.

Among the age group, the highest conception rate was in between 4 and 5 years with 72.31 and 70.51% respectively and lowest conception (43.48%) rate was in cows of 9 years of age or above. Schiling and England (1968) studied the effect of age, fertility in the beef cows and reported that fertility is highest in between 4 and 5 years age and declined after 10 years of age which is closely related with the present study.

The frequency distribution of conception rate is presented in table 4. Among 350 cows inseminated 195 animals required 1-2 services and 25 requires 3 or more services. This result was in disagreement with the El-Amin et al., (1981), they reported that the breed group has no influence on service per conception.

Out of 300 cows 195 cows required at least 1-2 service and other required 3 or more services giving the conception rate of 65% for 1-2 service and 50% 3 or more service (Table 5).

The service per conception was higher (1.75) in Friesian cross followed by Sahiwal cross (1.47) and lowest in local breed with overall number of service per conception of cows in Kushtia district was 1.59 (Table 1). Parity 3 and 4 needed lowest (1.26-1.33) service per conception but null parity or cows with parity more than 6 needed more than 2 services per conception (Table 2). More service was required for heifer than older animals (Table 3). It is demonstrated that breed of cows at differ age and parity has considerable effect on conception rate. To achieve the desire rate of conception, farmer should inseminate their cows considering the age and parity of the cows.

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