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# Conception Rate Study with Artificial Insemination in Goats

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## ABSTRACT

*Frozen Semen doses from seven Sirohi bucks purchased from Rajasthan and stationed at BAIF Central Research Station Uruli Kanchan were supplied to 18 locations in rural area for assessing the success of A.I. under field conditions.. The information on 2636 A.I. was available. Followup was 55.65 %. The overall conception rate (based on kidding) in goats was observed to be 26.04 %. Regionwise conception rate varied from 21.06 to 38.46 %. By and large the season did not affect the conception rate in goats. Although more inseminations were recorded during rainy season, the goats conceived round the year. Paritywise conception rate ranged from 22.17 to 33.71 %. Although it increased from first to fifth lactations, the differences were not significant. The effect of buck on conception rate in goats was important. Four packages with different sperm concentrations (30,60,90 and 120 million sperms per dose) were used.The average conception rate varied from 23.23 % to 27.27%. While no firm conclusions could be drawn on the package used because of smaller number of observations in each class, the data indicated possibility of achieving conceptions even with reduced number of sperms than with 120 million sperms per dose. Further work is recommended. It was concluded that besides strengthening the training of inseminators, investigations on semen freezing technique and sperm dose packing are needed to be undertaken to improve the conception rate in field.*

*Key words: Milk, Meat, Fiber, Skins, Manure*

## INTRODUCTION

Goat contribute to the subsistence of small holders, landless rural poor, by providing milk, meat, fiber, skins and manure. Goats along with sheep thus have an important role in income generation, capital storage, employment generation and improving household nutrition. The importance of goats in the rural economy of India is thus well established, Both in Asia and world, India has the largest goat population Nearly 35 % of the meat consumed in the country comes from goats[1].

Goats are also utilized as biological control for brush and undesirable forbs. The browsing, if controlled, accelerates vegetation, growth of trees, shrubs and surface vegetation[1].

Although the need is realized for improvement of goat performance through use of genetically superior bucks, absence / nonavailability of alternate technology at village level leads to adoption of natural service which is the normal way of breeding goats in the rural area of the country. Recent survey[2] demonstrated the felt need for goat A.I. in Maharashtra since the small size of flocks are maintained by farmer in village who do not own the breeding buck and hiring buck services for breeding is costly. The A.I. offers opportunities to widely utilize the superior male to its fullest extent. The technique is widely used in cattle and can also be used in goats. The adoption at field level needs to be evaluated. An analysis of field A.I. data were undertaken to examine the status of A.I. under field conditions.

## MATERIAL AND METHODS

Seven Sirohi bucks were purchased from Rajasthan and were brought to Uruli Kanchan. They were stall fed and maintained in individual buck pens and were fed greens and concentrated as per the body weight standards. They were vaccinated for FMD, Enterotoxaemia, H.S. regularly. The semen were collected and freezed using Tris Egg yolk dilutor method.. The frozen semen was quarantined for one month before it was released for field use. The field A. I. Technicians were trained for A. I. in goats. The animals were selected for A.I. after confirming from the farmers about the symptoms of heat.confirmed by examination with 8 inch long vaginal speculam. The semen straw was thawed in clean water at 37 °c for 30 seconds. The insemination was carried out by lifting up hind quarters of the animal to be inseminated. and using French model AI gun with locking device and disposable sheath The semen was deposited in midcervix region. The semen packed in four packages (30, 60, 90 and 120 million per dose) were supplied in french ministraws to 18 field centres located in Kopergaon, Sangamner and Uruli Kanchan regions of Western Maharashtra. The data collected was analysed using standard statistical procedures

## RESULTS AND DISCUSSIONS

The information on total 2636 A.I. was available. Out of which 1467 were followed. Thus the followup was 55.65 %. Since the results of A.I. are presently confirmed on the basis of kidding, the followup results of 1169 doses were not available on account of reasons like sale, death transfer, noncooperation of owner as well as animals being pregnant and kidding not yet reported etc.

The overall conception rate (based on kidding) in goats was observed to be 26.04 %. Most of the available reports are on animals inseminated after synchronisation. Summermatter and Flukiger[3] in Torrenberg, Saanen and Chamois colour breeds of goats have reported higher conception rates of 43.8

Gibbons *et al.*[5], have reported conception rate with frozen semen in Angora goat to be 28.50% which is similar to that observed in the present investigation. Horak[4] in Czechoslovakian goats observed that the conception rate with frozen semen increased from 33.6 to 53.2 % from 1971 to 1978.

Regionwise conception rates are depicted in Table -1. Among 18 locations Where the semen was used , The highest conception rate in Kopargaon region was noted at K248 ( 47.82%) and K285 (55%) and K408 (80%) while in the same region lowest was noted at K286 (9.52 %), K121 (16.34 %) and K500 (21.49%). In Sangamner region the highest conception rate was recorded at S402 (28.30 %) while the lowest was at S280 (11.53%). In Uruli Kanchan region the highest conception rate was noted at U999 (46.0 %) and lowest was at U302 (29.03%). The wide variation in the conception rate between and within region indicates the variability in the conception rate of goat semen use. The sample size of data for arriving at conception rate, the agroecological variations among the locations, training status and skill level of inseminators and their workload etc. could be some of the reasons for variations in conception rate need to be investigated. Year wise results of A.I. carried out in field goats are presented in Table 2. It can be seen from the table that in the first year, the inseminations were undertaken by the

research technician or under his direct supervision hence the results were better than those in successive years. After the initial trials, the semen was handed over to the field staff which was engaged in undertaking cattle/buffalo inseminations. The number of inseminations in 2001 were to small to draw any conclusions.

The results of month and seasonwise inseminations are presented in Table -3. It can be noted from the table that by and large the season did not affect the conception rate in goats. It was noted that although more inseminations were recorded during rainy season than in other season. The goats conceived round the year. Since no comparative reports were available to crosscheck this behavior, no conclusions could be drawn however, the seasonality in breeding recorded in some areas could be linked with the feed resources..

The effect of parity was examined and. the results are presented in Table -4. It was noted that number of pubertal conceptions were more than those in adult does. The conception frequency increased with parity from first to fifth and above and the conception rate ranged from 22.17 to 33.71 % .The differences in the conception rates between the lactations were not statistically significant.

The effect of Buck on the conception rates were examined. The results are presented in Table-5. The buck Bhanu showed highest conception rate of 53.57 % followed by Bonny (38.98 %). The lowest conceptions were recorded after the use of Boss (19.34 %) and Bhiru (19.77 %). The results indicated that the variation in conception in goats could also be due to the variation in bucks.

The semen was packed in Minifrench straws and different sperm concentration was used per dose of straws. Four packages with different sperm concentrates (30,60,90 and 120 million sperms per dose) were used. Initially, the few inseminations carried out using 30 million sperm dose did not result in any pregnancy. Then 30 million sperm dose was used immediately after oestrus detection and twelve hour later in the same heat and the results were recorded as those of 30 million. Thus infact it was 60 million (fractionated in two doses). The results of A.I. due to use of different packages is presented in Table -6. The average conception rate varied from 23.23 % to 27.27%. No reports were available for comparison of the findings. No firm conclusions could be drawn because of smaller number of observations in each class however the data indicated possibility of achieving conceptions even with reduced number of sperms than with 120 million sperms per dose. Further work would be needed to confirm these findings.

It was concluded that besides strengthening the training of inseminators, investigations on semen freezing technique and sperm dose packing are needed to be undertaken to improve the conception rate of frozen semen in field.

**Table 1: Location wise conception rate of frozen semen in Goats**

| Sr. No. | Location code | No. of A.I. | No. Follwed | No. Pregnant | Conception Rate % | No.of kidding | No. of kids | | | Litter size |
|---------|---------------|-------------|-------------|--------------|-------------------|---------------|-----|-----|-----|-------------|
| | | | | | | | M | F | T | |
| 1. | K121 | 152 | 104 | 17 | 16.34 | 15 | 10 | 12 | 22 | 1.47 |
| 2 | K244 | 116 | 97 | 35 | 36.08 | 34 | 19 | 28 | 47 | 1.38 |
| 3 | K245 | 168 | 147 | 44 | 29.93 | 34 | 33 | 13 | 46 | 1.35 |
| 4 | K248 | 72 | 46 | 22 | 47.82 | 19 | 20 | 14 | 34 | 1.79 |
| 5 | K285 | 401 | 40 | 22 | 55.00 | 17 | 18 | 14 | 32 | 1.88 |
| 6 | K286 | 103 | 63 | 6 | 9.52 | 6 | 5 | 4 | 9 | 1.5 |
| 7 | K407 | 16 | 11 | 3 | 27.27 | 1 | 0 | 2 | 2 | 2.0 |
| 8 | K408 | 10 | 5 | 4 | 80.00 | 1 | 1 | 0 | 1 | 1 |
| 9 | K500 | 216 | 214 | 46 | 21.49 | 44 | 49 | 23 | 72 | 1.64 |
| | **Kopargaon** | **1254** | **727** | **199** | **27.37** | **171** | **155** | **110** | **265** | **1.55** |
| 10 | S218 | 86 | 19 | 5 | 26.31 | 5 | 4 | 5 | 9 | 1.80 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | S253 | 345 | 108 | 23 | 21.29 | 20 | 21 | 18 | 39 | 1.95 |
| 12 | S280 | 65 | 26 | 3 | 11.53 | 4 | 1 | 9 | 10 | 2.5 |
| 13 | S281 | 263 | 234 | 37 | 15.81 | 29 | 23 | 25 | 48 | 1.66 |
| 14 | S282 | 40 | 38 | 10 | 26.31 | 8 | 6 | 6 | 12 | 1.50 |
| 15 | S402 | 168 | 159 | 45 | 28.30 | 44 | 39 | 43 | 82 | 1.86 |
| | **Sangamner** | **967** | **584** | **123** | **21.06** | **110** | **94** | **106** | **200** | **1.82** |
| 16 | U302 | 183 | 62 | 18 | 29.03 | 14 | 12 | 14 | 26 | 1.86 |
| 17 | U329 | 30 | 17 | 6 | 35 | 4 | 4 | 2 | 6 | 1.50 |
| 18 | U999 | 202 | 77 | 36 | 46 | 17 | 19 | 11 | 30 | 1.75 |
| | **Uruli** | **415** | **156** | **60** | **38.46** | **35** | **35** | **27** | **62** | **1.77** |
| | **Total** | **2636** | **1467** | **382** | **26.04** | **316** | **284** | **243** | **527** | **1.67** |

**Table 2: Year Wise mean conception rate (%) of A.I. using frozen semen**

| Year | No. of A.I. | No. Follwed | No. Pregnant | Conception Rate % | No.of kiding | No. of kids | | | Litter size |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | M | F | T | |
| 1998 | 199 | 110 | 49 | 44.54 | 29 | 30 | 22 | 52 | 1.79 |
| 1999 | 1341 | 690 | 160 | 23.18 | 139 | 129 | 125 | 254 | 1.83 |
| 2000 | 1032 | 636 | 169 | 26.57 | 145 | 121 | 94 | 215 | 1.48 |
| 2001 | 64 | 31 | 4 | 12.90 | 3 | 4 | 2 | 6 | 2.00 |
| Overall | 2636 | 1467 | 382 | 26.03 | 316 | 284 | 243 | 527 | 1.67 |

**Table 3: Month- and seasonwise AI and conception rate in village goats inseminated with frozen semen**

| SN | Month of A.I. | No. of A.I. | No. Follwed | No. Pregnant | Conception Rate % | No.of kiding | No. of kids | | | Litter size |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | M | F | T | |
| 1. | Jun | 380 | 189 | 49 | 25.92 | 48 | 54 | 38 | 92 | 1.92 |
| 2 | Jul | 387 | 203 | 52 | 25.49 | 46 | 36 | 40 | 76 | 1.65 |
| 3 | Aug | 314 | 206 | 57 | 27.66 | 41 | 34 | 35 | 69 | 1.68 |
| 4 | Sep | 255 | 170 | 44 | 25.88 | 41 | 36 | 32 | 68 | 1.66 |
| | **Rainy** | **1336** | **768** | **202** | **26.26** | **176** | **160** | **145** | **305** | **1.73** |
| 5 | Oct | 232 | 129 | 42 | 31.57 | 36 | 26 | 33 | 59 | 1.64 |
| 6 | Nov | 165 | 113 | 29 | 25.21 | 20 | 15 | 15 | 30 | 1.50 |
| 7 | Dec | 207 | 129 | 30 | 23.07 | 24 | 22 | 18 | 40 | 1.67 |
| 8 | Jan | 184 | 105 | 19 | 18.09 | 15 | 17 | 7 | 24 | 1.60 |
| | **Winter** | **788** | **476** | **120** | **24.84** | **95** | **80** | **73** | **153** | **1.61** |
| 9 | Feb | 108 | 46 | 8 | 17.39 | 7 | 6 | 4 | 10 | 1.43 |
| 10 | Mar | 68 | 40 | 8 | 20.0 | 6 | 7 | 3 | 10 | 1.67 |
| 11 | Apr | 84 | 43 | 21 | 48.83 | 11 | 12 | 3 | 15 | 1.36 |
| 12 | May | 252 | 94 | 23 | 24.46 | 21 | 19 | 15 | 34 | 1.62 |
| | **Summer** | **512** | **223** | **60** | **26.90** | **45** | **44** | **25** | **69** | **1.67** |
| | **Total** | **2636** | **1467** | **382** | **26.03** | **316** | **284** | **243** | **527** | **1.67** |

**Table 4: Parity Wise number of A.I and the pregnancies in village goats inseminated with frozen semen**

| Lact. No. | No. of A.I. | No. of Follwed | No. of Pregnant | Conception Rate % | No. of kiding | No. of kids | | | Litter size |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | M | F | T | |
| 1 | 464 | 236 | 67 | 28.38 | 54 | 49 | 27 | 76 | 1.41 |
| 2 | 587 | 374 | 93 | 24.86 | 77 | 69 | 61 | 130 | 1.69 |

     

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 640 | 425 | 106 | 24.94 | 89 | 80 | 78 | 158 | 1.78 |
| 4 | 263 | 175 | 59 | 33.71 | 52 | 44 | 38 | 82 | 1.58 |
| 5th & above | 682 | 257 | 57 | 22.17 | 44 | 42 | 39 | 81 | 1.84 |
| **ALL** | **2636** | **1467** | **382** | **26.03** | **316** | **284** | **243** | **527** | **1.67** |

**Table 5 Buckwise inseminations carried out and conceptions recorded with frozen semen in village goats**

| Buck Name | No. of A.I. | No. of Follwed | No. of Pregnant | Conception Rate % | No. of kiding | No. of kids | | | Litter size |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | M | F | T | |
| x | 149 | 68 | 23 | 33.82 | 15 | 13 | 18 | 31 | 2.07 |
| Baj | 699 | 366 | 109 | 29.78 | 88 | 73 | 75 | 148 | 1.68 |
| Bhanu | 53 | 28 | 15 | 53.57 | 9 | 10 | 3 | 13 | 1.44 |
| Bhiru | 465 | 268 | 53 | 19.77 | 44 | 45 | 10 | 55 | 1.55 |
| Bindu | 130 | 62 | 18 | 29.03 | 11 | 11 | 10 | 21 | 1.91 |
| Bonny | 65 | 59 | 23 | 38.98 | 23 | 25 | 13 | 38 | 1.65 |
| Boss | 523 | 304 | 59 | 19.34 | 53 | 41 | 45 | 86 | 1.62 |
| Bunty | 552 | 312 | 82 | 26.28 | 73 | 66 | 56 | 122 | 1.67 |
| | **2636** | **1467** | **382** | **26.03** | **316** | **284** | **243** | **527** | **1.67** |

X -  Buck name not recorded.

**Table 6: Number of inseminations and pregnancies recorded using different sperm dose per straw for A.I. with frozen semen in village goats**

| Dose | No. of A.I. | No. of Follwed | No. of Pregnant | Conception Rate % | No. of kiding | No. of kids | | | Litter size |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | M | F | T | |
| N.R.* | 701 | 247 | 88 | 35.62 | 64 | 66 | 48 | 114 | 1.78 |
| 30 | 36 | 22 | 6 | 27.27 | 4 | 2 | 6 | 8 | 2.00 |
| 60 | 357 | 161 | 40 | 24.84 | 37 | 38 | 29 | 67 | 1.81 |
| 90 | 410 | 284 | 66 | 23.23 | 52 | 40 | 39 | 79 | 1.52 |
| 120 | 1132 | 753 | 182 | 24.16 | 159 | 138 | 121 | 259 | 1.63 |
| | **2636** | **1467** | **382** | **26.03** | **316** | **284** | **243** | **527** | **1.67** |

* Sperm dose not recorded.

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