

## 345. Imparting Artificial Insemination Technique and Pregnancy **Diagnosis to DCS Staff–A Study**

*S. S. Hiremath*

Karnataka Milk Federation, Training Centre, Rayapur, Dharwad-580 009, Karnataka India  
hshivayogi@yahoo.com 0836-2322674(O) ; 09945505110(M)

**Abstract.** Artificial Insemination (AI) Technique was the first great biotechnology applied to improve reproduction and genetics of farm animals. It has had an enormous impact world wide in many species, particularly in dairy animals. In India to improve the local breeds for milk production, thereby India achieved the number one position in Milk Production in the world (110 MT) Accurate artificial insemination technique requires concentration, attention to detail, a clear understanding of female reproductive anatomy and physiology. This is an art even laymen can perform, provided one should undergo proper training and trainee should work with numerous reproductive organs which are brought from slaughter house, and receive considerable practice inseminating a variety of live cows and buffaloes. This study was conducted at KMF Training Centre, Dharwad. The 30 days duration programme divided into 4 sessions: theory session, hands-on session, practical session and field session. After training it was assessed for conception rate, calf born rate and treatment done by the trainee. Some trainee needs Refresher Training. These trainees are working in the Milk Co.op. Society and doing wonderful job in the dairy battle field of artificial insemination without frontier's. "Everyone who is successful must have dreamt of something."

**Keywords:** Artificial Insemination, estrus, semen, Liquid nitrogen, Dairy Co-op staff

### **Introduction**

Artificial Insemination is the deposition of semen (spermatozoa) in the female genitalia by instrument, rather than by male genitalia. The semen is collected from the male genitalia by using artificial vagina method; the same one deposited or diluted form into the female genitalia by using mechanical method (AI gun).

Artificial Insemination (AI), as practiced by bees and many other flying insects, has played an important role in plant reproduction for a very long time, use of AI in animals is a human invention and more recent. Undocumented tales exist of Arabs obtaining semen from mated mares belonging to rival groups and using the same semen to inseminate their own mares. AI had its origin in 1322 by Arabs First AI to domestic animals was conducted in dogs by Italian Physiologist. In 1678 Leenwenhock discovered the sperm and these are capable of making female pregnant. First Time in India in the year 1939 it was done by Dr. Sampath Kumar at palace dairy farm in Mysore.

In the initial stages of attempting to develop AI there were several obstacles. The general public was against research that had nothing to do with sex. Associated with this there was the fear that AI would lead to abnormalities. Finally it was difficult to secure funds, to support research because influential cattle breeders opposed AI, believing that this would destroy their market of using a bull for insemination. Later on fear was overcome with positive facts.

The acceptance of AI technique world wide provided the impetus for developing other technology such as cryopreservation and sexing of sperm, estrus cycle regulation and embryo harvesting, freezing, culture and transfer and cloning. And new, highly effective methods of sire evaluation were developed. The history of development of AI is reviewed, particularly in dairy cattle in which the impact on genetic development and control of venereal diseases has been investigated. In females detection of estrus cycle and control of estrus cycle also were important. The development of AI is a remarkable story of tireless workers dedicated to the pursuit of knowledge, to the replacement of fiction with facts, and the application thereof. In the whole world almost all developed and developing countries are accepted the AI technique. This technology is carried out by dairy farmers in some countries. Whereas in India government hospitals, milk dairy co-operative staff and NGO's are doing.

### **Objectives**

- (1) To teach trainee how to place diluted semen in the most appropriate part of the female's genitalia organs to maximize subsequent conception.
- (2) Trainee should obtain a working knowledge of female reproductive anatomy and physiology.
- (3) Identify the proper estrus state.
- (4) Developing the skill to thread the insemination gun through the cervix.

- (5) Handling of liquid nitrogen containers.
- (6) The important of proper sanitation.
- (7) The teaching of detection of pregnancy by use of manual palpation per rectum.

### Methodology

A study was conducted at KMF Training Centre at Dharwad in North Karnataka for the last 25 years more than 3000 DCS Staff of heterogeneous mass of men and women were trained in AI & PD. For the purpose of study randomly selected 300 DCS Staff trained. A sample questionnaire was used for Primary data collection such as sex, age, qualification, socio-economical status of the trainee. And further necessary secondary data information collected from the trainee's, farmer's, Extension Officers, Veterinary Officers and other Senior union Officials about the performance of the trainee's.

*(a)*  
**Sex**

Sl.No.	Sex	No.	%	
I	Male	2600	86.70	
II	Female	400	13.30	

*(b)*  
**Age group**

Sl.No.	Age	No.	%	
I	20-25	1448	48.20	
II	25-30	660	22.00	
III	30-31	425	14.10	
IV	35-40	327	11.00	
V	40-45	140	04.70	

*(c)*  
**Caste group**

Sl.No.	Group	No.	%	
I	General	1408	46.93	
II	OBC	902	30.06	
III	SC	298	09.93	
IV	ST	142	04.73	
V	Others	250	08.35	

*(d)* Educational qualifications

Sl.No.	Qualifications	No.	%	
I	Secondary	528	17.62	
II	Pre-university	1520	50.66	
III	Graduate	682	22.73	
IV	Post Graduate	149	04.96	
V	Others	121	04.03	

*(e)* **Socio-economical status**

Sl.No.	Category	No.	%	
I	BPL	1525	50.83	
II	SMF	1120	37.33	

III	MMF			300	10.00
IV	Land Lords		55		1.84

AI training consists of 25 member trainee's in a batch, again batch is divided into 4-5 groups for the purpose practical in each group contains 5 trainee's. On first day of training registration, introduction and orientation about the programme were done.

- (1) Hands on session(slaughter house)
- (2) Practical session(classroom)
- (3) Theory session(classroom)
- (4) Field session ( Hospital)

***Hands on session***

Veterinarians along with trainee's visit the slaughter house in the early morning. Before slaughtering the animals are brought to the near by Veterinary Hospital for rectal examination. In each group five trainees one animal is provided, for rectal examination, the trainees should be asked to have finger nails cut, Jeweler removed (female) and wear gloves with sufficient lubricants.

Veterinary doctor along with trainee put their hand together per rectal how to catch hold the cervix and examination of the different parts of the female genitalia such as uterine hams, uterine body, ovaries, matured follicles and corpusluteum while practicing repeated / in expert practice of the produce may result in severe straining, ballooning of the rectum, bleeding or some times thickening of the rectal wall in such condition animal may be replaced, Usually five trainee's are allowed to examine. One animal in the beginning session later on up to eight are allowed to examination. Animals used for hands-on session once session not be reused (same day these animals are slaughter). While palpating reproductive tract to find the anatomical land mark for insemination trainee will usually obtain an idea of the overall size of the reproductive tract. Some trainee's may get the impression that the larger the cervix is the longer the reproductive track, this assumption is not correct. There is not a strong relationship between size of the uterine body and the diameter of the cervix or length of the reproductive tract. This may lead to inseminators/trainee making insemination errors. This hands-on session (slaughter house) is about 10 days. By the end of this session trainee will able to asses the reproductive tract size, different parts of the uterus, callable of catch hold of the cervix without much strain/bleeding and he/she is able to pass the AI gun through cervix because some animals are in estrus stage, some may be infected with venerable diseases. In per rectal examination some animals are found pregnant, trainee will get the idea about the size of the uterine horns and appropriate duration of the pregnancy.

***Practical session (class room)***

The slaughtered animals uterus are brought to training centre for examination on table these specimen are placed/examined for:

- (a) Identification of different genitalia parts.
- (b) Passing the AI gun without seeing the specimen.
- (c) Dissection of the genitalia to show the interior of the uterus such as cotyledons, ovaries, corpusluteum, follicles developed and developing.
- (d) Pregnant uterus–fetus, foetal membranes, flints, umbilical cord, etc.

***Theory session (class room)***

The following subjects taught to trainee in the class room session:

- Trainees should obtain a good knowledge of reproductive anatomy and physiology of female & male organs.
- Developing the skill to thread the insemination gun through the cervix should not be the only objective and also
  - The importance of sanitation and thawing methods.
  - The perfection of skills to consistency identifies the proper site of semen deposition.
  - Handling of container (liquid nitrogen) and its importance.
  - AI history, advantages, management Breeding and feeding and disease control measures.
  - Role of hormones produced by the different glands and their role in reproduction.
  - Pregnancy diagnosis and its importance.

- Veterinary First Aid drugs and its uses.
- End of the session Pashupalan A.V. cassette.

**Field session (hospital visits)**

Each group will be sent to visit different village level Veterinary Hospital daily in charge of the Veterinary Hospital will take care of the supervision work. Daily trainee's will assess for the following aspects:

- (1) Identification breed, age, stage of lactation, general body condition of the animal.
- (2) Identification of estrus stage and symptoms externally as well as internal.
- (3) Thawing of the semen straw and loading of the AI gun.
- (4) Sanitation procedure.
- (5) Thread the gun through cervix and placing into the uterine body.
- (6) Deposition of the diluted semen.
- (7) Recording.
- (8) Any advice to the farmer/treatment/follow-ups if any.

**Pregnancy**

Students/ trainees must prior instruction on the anatomy and physiology of the genitalia of female reproductive organs are given with help of slides, videos and also slaughter house, specimens, inserting the lubricated hands per rectal observe the enlargement of the uterine horns either left or right is the most appropriate method of diagnosing the pregnancy in cows and buffaloes in case of heifers it is easy to diagnosis where as it is difficult in 3-4 calved animals.

**Observations: In AI technique**

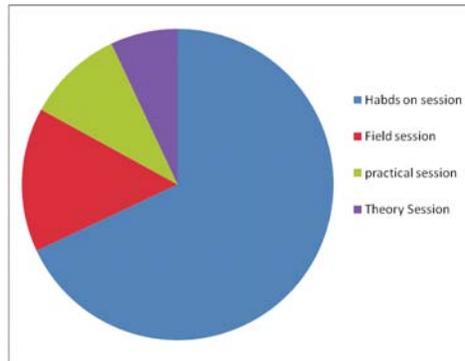
Some of the observations are made while practicing the AI technique.

- (1) To avoid the possibility of entering the urethral opening on the floor of vagina, the insemination (AI) gun should be inserted into the Vulva upward at a 30 C to 40 C angle.
- (2) To place the cervix into the insemination gun, maintain slight forward pressure on the gun while manipulating the cervix and slightly ahead of the gun.
- (3) The anterior portion of the vagina, termed the fornixvagina, tends to stretch rather easily when the insemination gun is pushed forward and beyond the cervix. This may give the false impression that the gun is advancing through the cervix, when indeed it is above, below or to either side of the cervix. But unable to feel the tip of the gun in the cervix(gun may be in the vaginal fold)
- (4) The semen deposition place in the female genitalia in the uterine body is quite small, accurate gun tip placement is probably the most important skill involved in the whole AI technique.
- (5) Once the gun tip is aligned with the internal cervical os, deposit the semen. Semen deposition take about 5 seconds, slow delivery maximizes the amount of semen delivered straw and minimizes unequal flow of semen into one uterine horn.
- (6) During the process of semen deposition, care should take fingers of the palpating hand or not inadvertently, blocking a uterine horn or misdirecting the flow of semen in some manner.
- (7) Not to pull the insemination gun back through the service while the semen is being expelled.
- (8) If the animal has moved during the semen deposition, if AI gun has moved, stop the semen deposition and correctly reposition the gun tip in to the uterine body and deposit the semen. Inseminators generally identify this target area by feeling for the end of the cervix and tip of the gun as the gun emerges through the internal as or opening, depositing the semen in the cervix or randomly in the uterine horns may result in lower conception rates.

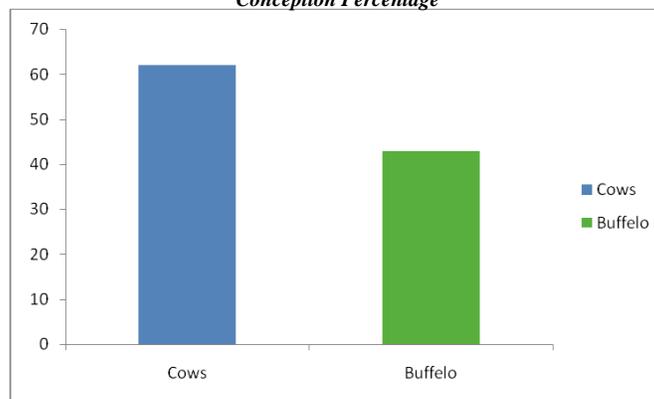
**Discussion & Analysis**

AI and Pregnancy diagnosis technique methods are highly technical and trainee's needs more hard work with memories reproductive tracts and receive considerable practice inseminating a variety of live cows and buffaloes. Developing the skill to pass the AI gun through cervix, handling of LN2 containers, sanitation and managerial aspects are also very important, since the largest group is heterogeneous mass of both sex, they needs different method and technique to understand the technical training. The most of the trainee's expressed their satisfaction 68%. Hands on session and field session are most suitable for the learning complicated technical training. 15% were happy with

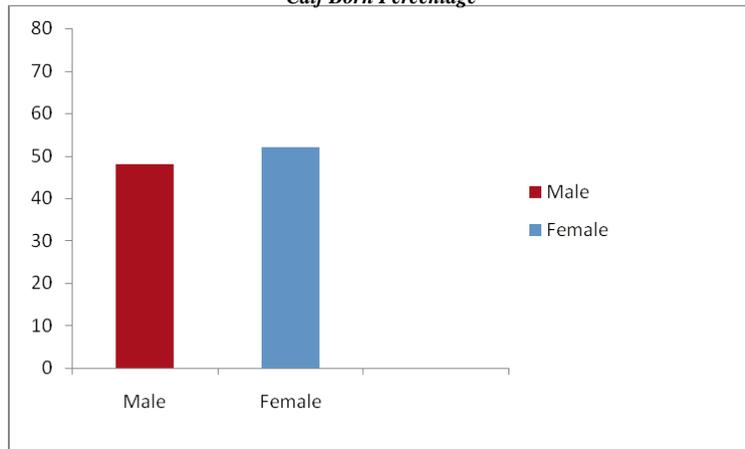
practical session, 10% were happy with theory session (class room) and 0.7% were happy with audio visual sessions and refresher training.



*Conception Percentage*



*Calf Born Percentage*



## Conclusion

The knowledge gained from the AI experience was extremely helpful in stepwise developments of each successive, reproductive technology, such as frozen semen, superovulation, embryo transfer and eventually, cloning. And at the same time public become better informed and more willing to accept the technology developed with worthy goals, and built in ethical application, could produce positive change benefiting the whole farming community especially in India. Worthy goals development of the necessary knowledge and skills ethical considerations all are essential components of any technology that will result in a positive impact on society and the environment. Thus, the

impact of artificial insemination was much more profound than simply another way to impregnate females. The study revealed and it is found that, Hands on session and Field Session are most suitable for the imparting AI technique and P.D. to DCS staff as per the study conducted at our training centre.

### **Recommendations**

1. After evaluating records, visit to Dairy Co-operative Societies, farmers interview if it appears insemination may be a problem. Then, consideration for AI refresher training.
2. All the AI workers should periodically attend a refresher training programme to review their technique, learn new developments and obtain recommendations regarding artificial insemination and pregnancy diagnosis technique.

### **Acknowledgement**

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