



**FACULTY OF AGRICULTURAL  
SCIENCES AND ALLIED  
INDUSTRIES**

# TOPIC : Improvement of Farm Animals and Poultry

## Cross breeding:

This is mating of animals from the two different established breeds Eg.: Jersey (b) x Kangayam (c) : Jersey (c) x Holstein Friesian (b). The cross bred animals will exhibit the mixture of qualities of both the parents breeds. The progeny will improve in production performance and will exhibit marked disease resistance characteristics of the native breed and is well adapted to with stand local climatic condition. 62.5% of exotic blood & 37.5% local blood – ideal .

Jersey x local breed.-  $F_1$ . 50% ND(c) x J (75%) + 25% ND –  $F_1$  50 J 50 ND x 100 J (B) So cross breeding is also taken up to evolve new breed.

### Age at maturity

### Economic traits

1. Age at 1<sup>st</sup> calving : Age in days of the cow or buffalo on the date of 1<sup>st</sup> calving.
2. Lactation Length or  
or cessation of milk (305 days)  
3. Lactation Yield : Milk yield in Kgs from the date of calving to the date of drying (corrected to 305 days)
4. Dry period : Days from the date of drying to the date of calving
5. Inter calving period : Days from the date or one calving to the date of next calving (1<sup>st</sup>,2<sup>nd</sup> )
6. Peak yield : The highest daily yield in Kgs during lactation period
7. Average Fat% : Average Fat %
8. Service period : The interval between calving and subsequent service resulting in conception
9. Breeding efficiency : Measured as the No. Services/Conception

**Breeding:** Production of off springs / young ones

Scientific breeding is needed to get better performance in livestock – milk – meat – wool – Egg

**Inbreeding:** mating of closely related animals in the same breed such as brother – sister mating

ii. **parents off spring mating-** when the mates have common ancestors -with in 4 generations this results in inbreeding

**Advantage:** A pure line of a particular breed can be maintained

**Disadvantage:** Loss of vigour, size, production fertility problems

**Out breeding:** Mating of unrelated animals in the same breed but with no common ancestor for a minimum of 4-6 generations.

**Grading:** Grading is a form of out crossing, where in bulls of a distinct breed are bred on non descript cows from generation to generation, so that in course of time a populations essentially resembling the breed from which the Bulls are used.

Non descript cow x Jersey Bull

F<sub>1</sub> 50% ND + 50% Jersey x Jersey Bull

F<sub>2</sub> 25% ND + 75% Jersey x Jersey Bull

F<sub>3</sub> 12.5% ND + 87.5% Jersey x Jersey Bull

After 5-6 generations the off springs will have 96.9 & 98.3% of the hereditary characters of 'Pure Breed'

So grading is a process by which a few 'Pure Breed' sires can rather quickly transform local variety of animals into a 'Group' resembling the pure breed.

### **Economic Traits**

<b>Particulars</b>	<b>Local</b>	<b>Exotic</b>	<b>Cross breed</b>
Birth weight	20Kg	Jersey – 25-30kg. Friesian – 30-35kg.	
Age at maturity	33 Months	15 months	18-24 months
Age at 1 <sup>st</sup> calving	42 months	24 months	30 months

Lactation yield	12000 Kg.	3000-6000Kg.	2100-2400
Lactation period	180-210 Days	305 days	240 – 270 days
Dry period	90-120 days	60 days	75 days
Inter calving period	18 months	12-13 months	13-14 months

## Oestrus cycle

**Proestrus:** (2 days) Period of building up growth of graffian Follicle which helps for the nourishment of ovum fluid contains hormone called 'oestrogen'. It causes changes in uterus, blood supply.

**Oestrus:** (1 day) During which the female is ready to receive male.

**Metoestrus:** (4 days) Implantation of the embryo takes place C.L. takes place. Prevents the growth of graffian follicle thereby arrests oestrus cycle.

**Diestrus:** (14 days) Further development of uterus takes place. If the animal has not conceived involution of uterus take place.

## Symptoms of Heat:

1. Off feed
2. Drop in milk yield
3. Restless and excited
4. Bellowing
5. Oedema / swelling of genitalia
6. frequent utination
7. Transparent mucous discharge
8. cow/buffalo which are in heat will mount on other animals and allows mounting of other animals.

## Optimum time for crossing

Egg/ova from ovary – released about 12-18 hours after the onset of symptoms of heat. Ovum will survive upto 16 hours after the release. Sperm live for 12-14 hours.

Morning signs of heat are exhibited – AI done in the evening : 12 hours delay.

**Proestrus** : This marks the animal – coming in heat.

GF – Ovary – growing – increased secretion of follicular fluid – Estradiol - increase  
No.of Cilia – increased Vascularity of uterus – increase in thickness of Epithelial wall of vagina .

The vaginal wall adjustment is well filled to prevent possible damage to the wall when coitus occurs.

**Oestrum** : This is the period of desire.

**'Graffian Follicle'** – Ripe or very turgid

This period is brought to an end by the rupture of the follicle (or) ovulation. Vulva becomes swollen. Vulva and Vagina – congested

**Met Oestrum** : This is the period when the organ returns to normal non congested condition.

During this period the cavity of the GF from which ovum has been expelled becomes recognized and forms a new structure known as C.L.

1. It prevents the maturation of further graffian follicle
2. It is essential for the implantation of the fertilized egg.
3. It is intimately concerned with the development of mammary gland.

**Diestrum** : Longest part of estrus cycle

Implantation – uterine milk – for the nourishment of the embryo prior to implantation.  
Absence of pregnancy. – returns to normal and thus the cycle continues.

### **ARTIFICIAL INSEMINATION.**

Artificial insemination is the deposition of male reproductive cells (sperm) in the female tract by mechanical means rather than "Natural Service"

### **ADVANTAGES :**

1. Increases usefulness of superior sires to extra ordinary degree.
2. Services of Superior Sires are greatly extended.

If the sires are used for Natural Service the animal can serve only 50-60 animals/year but under Artificial Insemination the amount of semen secreted by the animal can be used to satisfy the requirements of 1000 animals per year

### **DILUTION OF SEMEN**

Average of Sperm/mL	: 1000 million
Total volume of semen/2 ejaculate	:6 mL
	: (i.e.) 6000 million sperms.
No. of motile Sperms	: 90 %
Total number of motile sperms	: 5400 million.
Expected wastage during processing (i.e.) filling and sealing	: 10 %
Net no.of sperms available	: $5400 - 540 = 4860$
Minimum No. of sperms required / dose	: 30 Million.
∴ @ this rate no. of doses that could be prepared	: $4860 / 30 = 160$ doses
So, total no. of doses that can be prepared / week	: $160 \times 52$ weeks = 8320 doses.
Frozen semen required / dose	: 1 mL.

3.No need to maintain Breeding Bull.The frozen semen can be stored in the Liquid Nitrogen-196°C.

4.Semen can be quickly and easily transported by air to different continents.

5.Spreading of diseases is absolutely- NIL.

6.Overcomes the difficulty of size and weight between Dam and Sire.

7.Increase the rate of Conception because in the artificial insemination the semen is being deposited in the mid cervix .

8.Outstanding animals located apart can be mated.

9.Helps in better record keeping.

10. Old and heavy sizes bulls ,injured / disabled sires can be used.

**MERITS:**

- 1.Semen can be stored in the frozen state , so progeny can be obtained even after the transfer, WHY even after death of bull-15-20 years.( atomic, radioactive, X-ray unit)
- 2.Semen is expanded and no. of animal can be crossed.
- 3.Frozen semen can be transported to destination once in a month from the semen bank.

**DISADVANTAGES.**

- 1.Some bulls semen may not freeze well.