National Workshop on

"AI Delivery and INAPH System Implementation"

Improvement in Conception Rate in AI Delivery

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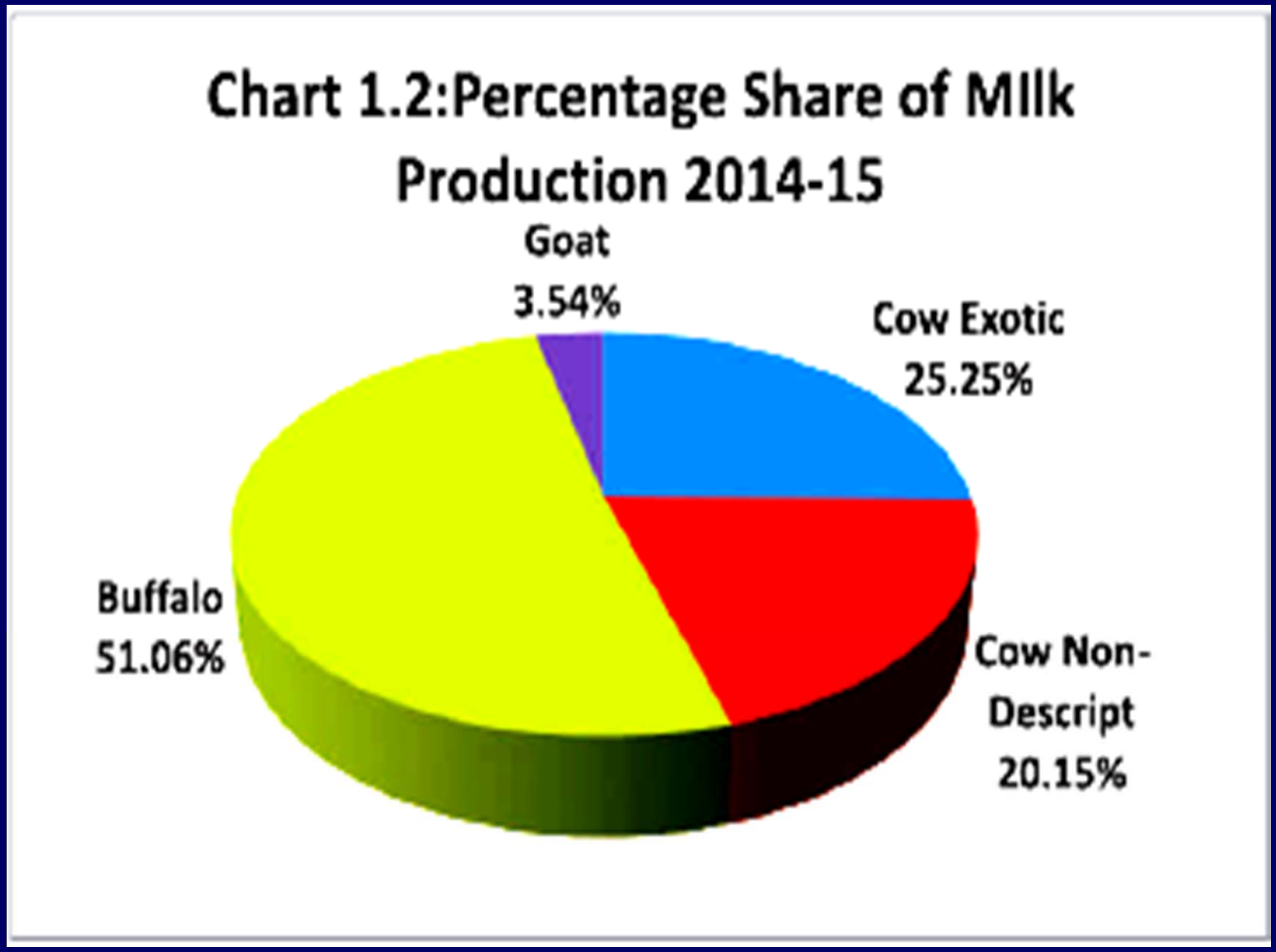
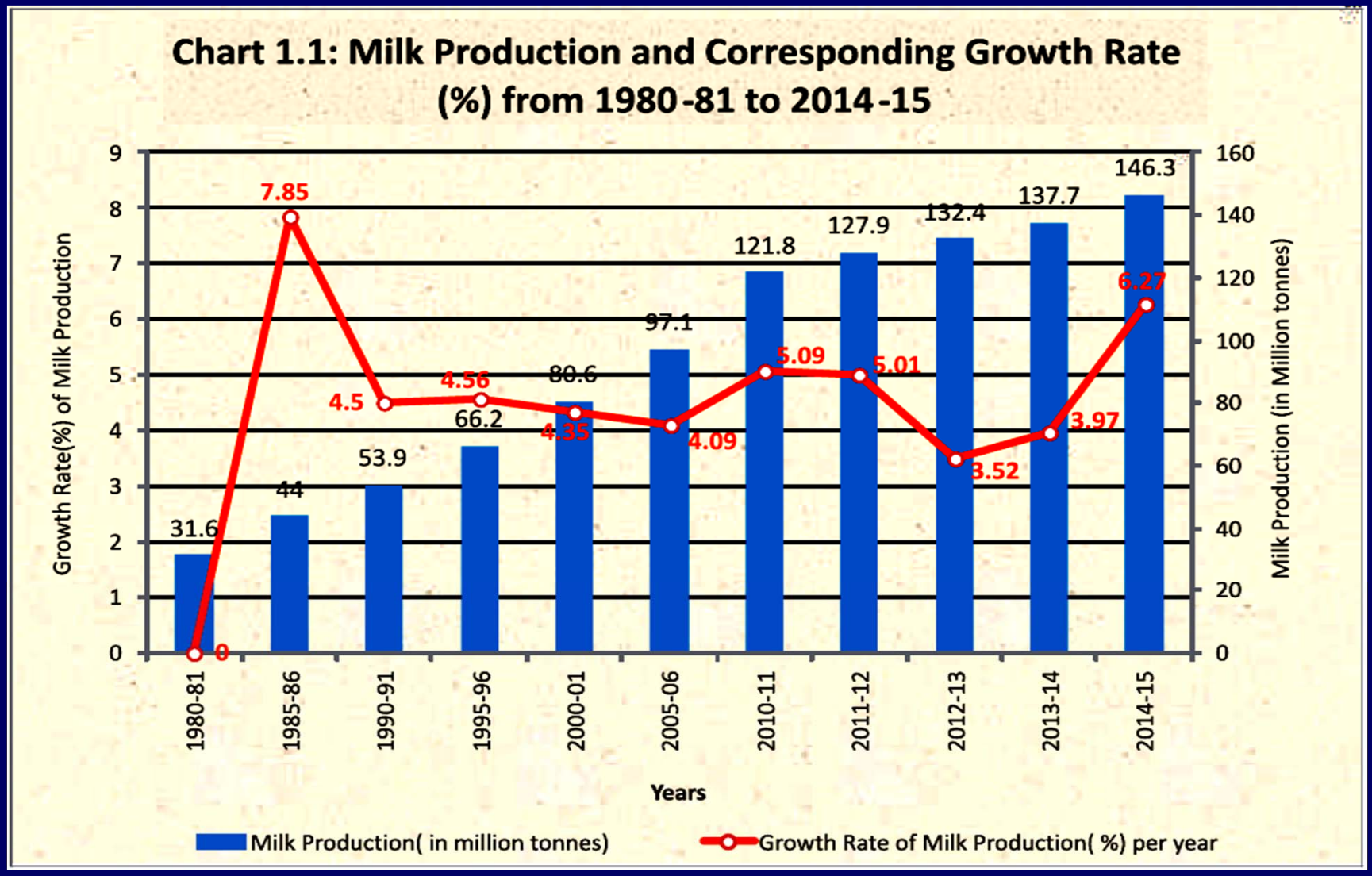
Annual Report DADF: Year 2015-16



Annual Report DADF: Year 2015-16



Annual Report DADF: Year 2015-16

Breeding Services			
Parameters	Year 1999-2000	Year 2014-2015	Increase
Semen Production (Million Straws)	22.00	85.00	3.86
No. of AIs (Million)	20 .00	65.30	6.27
Overall Consumption Rate (%)	20.00	35.00	1.75

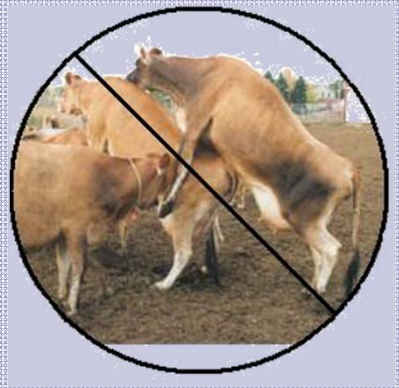
Cattle & Buffalo Keeping

- Mixed crop & livestock smallholder farming systems … India.
- Profitability …..
  - … Efficient reproduction
  - … Primary determinant of profitability
- Maximizing RE …
  - … Require matching of genotypes to production environment, together with appropriate husbandry practices
- Shorter …CCI
- High CR to natural / artificial breeding

Artificial insemination(AI) is the technique in which semen with living sperms is collected from the male and introduced into female reproductive tract at proper time with the help of instruments.

What Exactly Is Artificial Insemination?

Not This…



But This…

Inseminator may be

- Veterinarian
- Livestock Inspector
- AI Worker / Gopal Mitra / MAITRI

Introduction

- Incorrect AI technique…

  … lowers CR/PR

- Unfortunately …

  … inseminators develop some bad habits.

- Reviewing AI procedure …

  … help to eliminate common mistakes

- Contribution of inseminators …

  … crucial.

Inseminator.. As key person
Responsible … success / failure … AI program

AI

Proven impact on breed improvement

in developed countries.

In India,

even after 5-6 decades of introduction of AI,

Coverage 25-35 per cent……?

Technological gap ….Between

… scientific AI (MSP) &

… adopted process of AI by inseminators

Factors

Sociological,

psychological &

cultural characteristics

responsible for knowledge of inseminators

regarding recommended AI process

Technological gap in performing AI

1. Profile of inseminators
2. Knowledge level of inseminators (scientific AI)
3. Overall technological gap (components of scientific AI)
4. Relationship between profile & overall technological gap
5. Constraints faced by inseminators (adoption of scientific AI)
6. Seeking suggestions from inseminators

(for better implementation of field AI program)

Components of AI

1. Personal care & hygiene
2. Care of AI instruments & LN_2 container,
3. History taking
4. Actual observations of signs & symptoms
5. Thawing
6. Loading of AI gun
7. Insertion of gun & deposition of semen
8. Examination of gun & sheath post AI
9. Disposal of sheath, gloves, straws & cleaning of AI gun,
10. Recording breeding information

Producers who do not use AI for heifers And agree with the listed statements.

Statement	% Agree
AI for heifers is not profitable.	10
Conception rates are lower with AI.	45
There are more calving problems with AI.	20
Heat detection takes too much time.	57
Estrus is difficult to detect.	33
Synchronization is not profitable.	20
Synchronization requires too much labor.	27
The location of the heifers is inconvenient.	79
Lack restraint facilities	80

(Sulaiman, 1992)

AI : Valuable Reproductive Technological Tool

- **Harvesting maximum through AI**

  ……Farmers must detect the estrus accurately

  ……Ensuring AI done at correct time

- **Detect any cows that later return to estrus**

  … to be re-inseminated

- **Even when these conditions are satisfied**

  ……. Optimum CRs will only be achieved

  …….if the quality of semen used is good.

- **AI technicians …….. adequate training & skill**

… Handling Semen & Performing AI

AI : Important Breeding Services Input

- **Looking back over the shoulder…Introspection….**
- **Develop an insight …**

  to address the problem

  on large scale in the coming days

  by professionals, technicians & extension workers

  engaged in providing AI services
- **Look into … prevailing facts &**

  … challenges about AI at field level.

AI : Important Breeding Services Input

- Facts … *estrus detection limitations &*

  … associated errors by omission / commission

- Matter of concern

  … 32% cows bred when *not* in heat (Pelissier, 1982)

- Field study … three villages

  … overall incorrect inseminations (plasma P_4>0.5 ng/ml) occurred in 30.67% buffaloes, with 12.44 % luteal inseminations (Sharma *et al.,* 2008).

AI : Important Breeding Services Input

- **IMP cause of fertilization failure**
- ***Improper handling of frozen semen*** **…. issue …. at field level.**
- **Failure to follow MSP for retrieving, thawing, & protecting straws until AI results in damaged sperm membranes, cold- and heat- shocked sperm, or impaired sperm motility.**
- **Reduction in**

  … fertile life span of frozen-thawed sperm

  & ... CR also…

AI : Important Breeding Services Input

- To maintain maximum fertilization rates
- Essential to follow: recommended semen handling techniques

1) When removing straw for thawing, prevent exposure of other straws by keeping them below the frost line of the tank

2) Thaw straw in water at 37°C for at least 30-40 sec

3) Once thawed, provide thermal protection to the breeding unit in the French gun by keeping it at near body temperature until the semen is deposited in the female.

AI : Important Breeding Services Input

- Improper placement of semen in reproductive tract can be a limiting factor when AI technician is NOT sure where the tip of the gun has been placed while deposition of semen.
- Research demonstrated that fewer No. of motile sperm gain access to oviduct when semen is placed in cervix.
- Target for AI is uterine body.

  …. Approx. 85 to 90% of inseminate is expelled from the female by retrograde flow.

  … It is critical that semen be placed in uterus.

Figure 1. Radiographs of excised cow reproductive tracts illustrating insemination rod tip placement (left) & distribution of radiopaque semen (right)

Rod Tip Placement

Semen Deposition

Correct Technique of AI

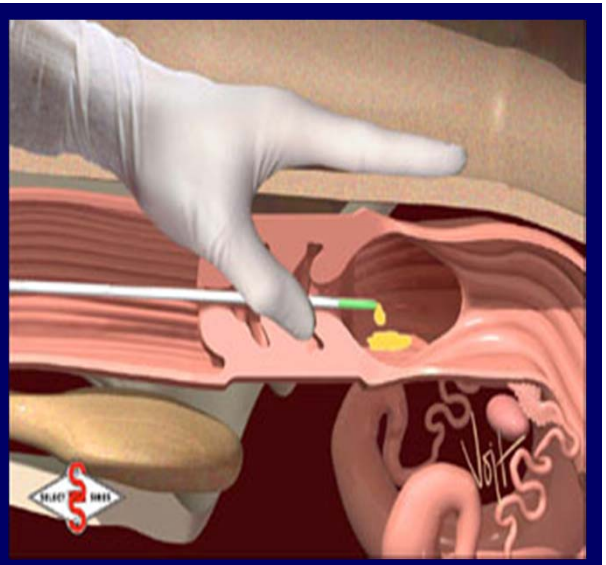
Placement of AI Gun

Deposition of Semen

Incorrect Technique, Uterine Horn Insemination

Incorrect Technique, Cervical Insemination

Correct Technique of AI



- Researchers … Pennsylvania State University
- Study
- Radiography evaluation (Vs. dye techniques)
- 20 professional technicians x 20 reproductive tracts
- 20 owner-inseminators x 20 reproductive tracts
- 39 % … gun tip placements …. in uterine body
- 25 % … gun tip placements …. In cervix
- 23 % … gun tip placements …. in right uterine horn
- 13 % … gun tip placements …. in left uterine horn

- 60 % … semen was distributed in cervix / disproportionately in one uterine horn
- 40 % … semen was located in uterine body / equally distributed in both uterine horns.

AI : Important Breeding Services Input

Table 1: Site of semen deposition by professional technicians

Site of Deposition	AI Technician's Ability	
	Below Average, %	Above Average, %
Vagina-Cervix	23.50	0.00
Body of Uterus	29.70	85.70
Right Horn	42.40	14.30
Left Horn	4.40	0.00

(Graham, 1966)

Table 1. Effect of site of semen deposition on C.R. in cow (Rao and Naidu, 2001)

Site of semen deposition	No. of cows	1st A.I.	CR %	2nd A.I.	CR %	Overall CR %
Mid cervix	64	33/64	51.56	18/31	58.06	53.68
Uterine body	83	50/83	60.24	24/33	72.72	63.79
Ipsilateral horn	87	64/87	73.56	17/23	73.91	73.63

Critical observations:
Proficiency of AI Technicians

- **Worth to share**
- **Personal communication**
- **Based on extensive evaluation &**

  Survey of field AI Centers

  (providing AI services along with implementation of PT programme for buffalo & cow)

Survey: Positive & Satisfactory Facts

Inseminators' Proficiency Parameters	%
Inseminators closed container lid immediately after taking straw	95.90
Inseminators used water bath for thawing the straw	98.60
All the inseminators use scissors to cut the straw	100.00
All the inseminators cut the straw correctly	93.20
All the inseminators lock the gun properly after loading the straw	100.00
Inseminators could insert AI gun in correct manner	91.90
Inseminators could pass the gun without trouble up to cervix	90.50
Inseminators deposited semen with slow & steady pressure on piston	91.90
Inseminators cooperated with animals behaviour during AI	91.90

Survey: Negative & Non-satisfactory Facts

- Some of the field inseminators

Not adhering to / loosely following MSP

- Indication of an alarming situation
- Practice of AI followed
- Resulted in to lower CR/PR

Range of 15 to 45 %.

Survey: Negative & Non-satisfactory Facts

Inseminators' Proficiency Parameters	%
Among animals inseminated, having medium to poor BCS	40.00
Negligence for inquiring about time of onset of estrus & its stage	19.00
Not ensuring whether animal being inseminated is in estrus or not?	19.00

Survey: Negative & Non-satisfactory Facts

Inseminators' Proficiency Parameters	%
Lifting the canister beyond the frost line while removing the straw	47.30
Not using straw holding forceps for removal of straw (mishandling)	13.70
Not using thermometer for monitoring thawing water temperature	17.60

Survey: Negative & Non-satisfactory Facts

Inseminators' Proficiency Parameters	%
Not allowing the enough thawing time to the straw to warm up	37.00
Not drying up the semen straw after thawing	20.30
Not bringing the air bubble up before cutting the semen straw	45.90
Not warming up the AI gun before loading the semen straw for AI	47.00

Survey: Negative & Non-satisfactory Facts

Inseminators' Proficiency Parameters	%
Not making sure about proper loading of the AI gun	25.70
Not preventing an exposure of loaded AI gun to direct sun light	16.40
Negligent about performing hygienic AI (cleaning the vulval lips)	75.00
Negligent for protecting the gun and preventing contamination of gun	32.40

Survey: Negative & Non-satisfactory Facts

Inseminators' Proficiency Parameters	%
Not careful for avoiding physical touch of AI gun to the exterior and preventing contamination of AI gun	21.60
Inseminators faced difficulty while penetrating the cervix	52.70
Hardly inseminators could deposit the semen in the deep cervix	35.10
Inseminators could not maintain the static position of gun during AI with either forward or backward displacement	47.90

Survey: Negative & Non-satisfactory Facts

Inseminators' Proficiency Parameters	%
Inseminators were not keen about observing the quality of discharge sticking to gun reflecting indirectly the uterine health	45.80
Inseminators surrendered to the owner's demand/desire/command, (unduly increasing number of AI and risk of genital infection)	23.60
Not following the norms of cleanliness of AI accessories	15.10
Not keen for sooner use of thawed semen for AI within a minute	24.00

Table: 1 Distribution of inseminators according to their economic motivation, risk orientation and knowledge level

Category	Economic motivation		Risk orientation		Knowledge level	
	Freq.	Per cent	Freq.	Per cent	Freq.	Per cent
Low	12	10.00	16	13.33	17	14.17
Med	82	68.33	87	72.50	85	70.83
High	26	21.67	17	14.17	18	15.00
Total	120	100.00	120	100.00	120	100.00

Distribution of inseminators (n=120) according to their component-wise knowledge level of scientific AI process

Components	Knowledge Level			Mean score	Rank
	Low	Medium	High		
Basic information of AI process	32 (26.67)	81 (67.50)	7 (5.83)	44.76	IX
Personal care and hygiene	16 (13.33)	90 (75.00)	14 (11.67)	72.50	V
Care : AI Instruments & LN_2 container	10 (8.33)	84 (70.00)	26 (21.67)	63.67	VI
History taking	12 (10.00)	96 (80.00)	12 (10.00)	79.88	II
Observations of estrus signs	9 (7.50)	106 (88.33)	5 (4.17)	55.83	VII
Thawing	12 (10.00)	98 (81.67)	10 (8.33)	77.13	III
Loading of AI gun	26 (21.67)	64 (53.33)	30 (25.00)	50.36	VIII
Insertion of gun deposition of semen	10 (8.33)	73 (60.84)	37 (30.83)	73.33	IV
Examination of gun & sheath post AI	35 (29.17)	85 (70.83)	0 (0.00)	89.17	I
Disposal (gloves, sheaths, straws and cleaning of AI gun)	11 (9.17)	89 (74.17)	20 (16.66)	42.92	X

Distribution of inseminators (n=120) according to level of performance of skills in components of scientific AI

Components	Knowledge Level			Mean Score	Rank
	Low	Medium	High		
Personal care and hygiene	20 (16.67)	82 (68.33)	18 (15.00)	4.70	VI
Care : AI Instruments & LN_2 container	13 (10.83)	92 (76.67)	15 (12.50)	6.53	II
History taking	15 (12.50)	81 (67.50)	24 (20.00)	3.22	VIII
Observations of estrus signs	17 (14.17)	91 (75.83)	12 (10.00)	6.43	IV
Thawing	17 (14.17)	84 (70.00)	19 (15.83)	6.48	III
Loading of AI gun	31 (25.83)	64 (53.33)	25 (20.84)	6.63	I
Insertion of gun deposition of semen	20 (16.67)	80 (66.66)	20 (16.67)	6.35	V
Examination of gun & sheath post AI	57 (47.50)	49 (40.83)	14 (11.67)	2.67	IX
Disposal (gloves, sheaths, straws and cleaning of AI gun)	13 (10.83)	85 (70.83)	22 (18.34)	1.56	X

Distribution of inseminators (n=120) according to their level of performance of skill in AI

Category	Frequency	Per cent
Low (up to 42.96 score)	15	12.50
Medium (42.97 - 53.44 score)	92	76.67
High (Above 53.44 score)	13	10.83
Total	120	100.00

Zero order correlation between independent variables of inseminators (n=120) & level of performance of skills in AI process

Independent variables	Correlation coefficient (r-value)
Personal characteristics	
Age	0.0416NS
Education	0.1760NS
Experience in animal husbandry occupation	0.1119NS
Experience as an inseminator	0.0903NS
Training received	0.1437NS
Social characteristics	
Size of family	-0.0233NS
Social participation	0.1674NS
Caste	-0.0156NS
Economic characteristics	
Occupation	-0.1635NS
Time spent in AI activities	0.0185NS
Size of land holding	**0.1889***
Size of herd	-0.0071NS
Annual income	0.1186NS
Annual income from AI activities	0.1127NS
Communicational characteristics	
Extension contact	0.1195NS
Mass media exposure	0.1603NS
Psychological characteristics	
Scientific orientation	0.0901NS
Economic motivation	**0.2100***
Risk orientation	0.1334 NS
Knowledge level of scientific AI process	**0.3461****

Summary

- **Performance of skills of AI by inseminators was influenced by personal, social, economic, communicational & psychological variables.**

- **Majority of inseminators had economic motivation, risk orientation and knowledge level between 68-72 %.**

- Inseminators had medium level of knowledge and performance of skills regarding scientific AI process for the components (Observations of estrus signs & Loading of AI gun) **and had a minimum rank for Disposal** (gloves, sheaths, straws and cleaning of AI gun).

- **Performance of skills of AI was related with risk orientation (+ve & NS), Economic motivation (+ve & S) and Knowledge level of scientific AI (+ve & HS)**

Conception Rate Formula

(Cow Fertility)

x

Heat Detection

x

(Semen Fertility)

x

(AI Technique)

Mess up one of these

and

say

goodbye

to

successful AI…..!

Pre-calving BCS Cows calving down in poor BCS had a longer calving to first service interval (CSI) and a longer calving to conception interval (CCI) than cows calving down with greater BCS (Table 1).

Table 1: Effect of pre-calving body condition score on calving to first service interval (CSI) and calving to conception interval (CCI) (days)

Pre-calving BCS category	CSI	CCI
≤2.50	67[a]	84[a]
2.75 to 3.00	62[b]	80[b]
3.25 to 3.50	59[c]	77[c]
≥3.75	58[d]	75[c]

Means, within columns, not having a common superscript differ significantly (P<0.05).

BCS during breeding period

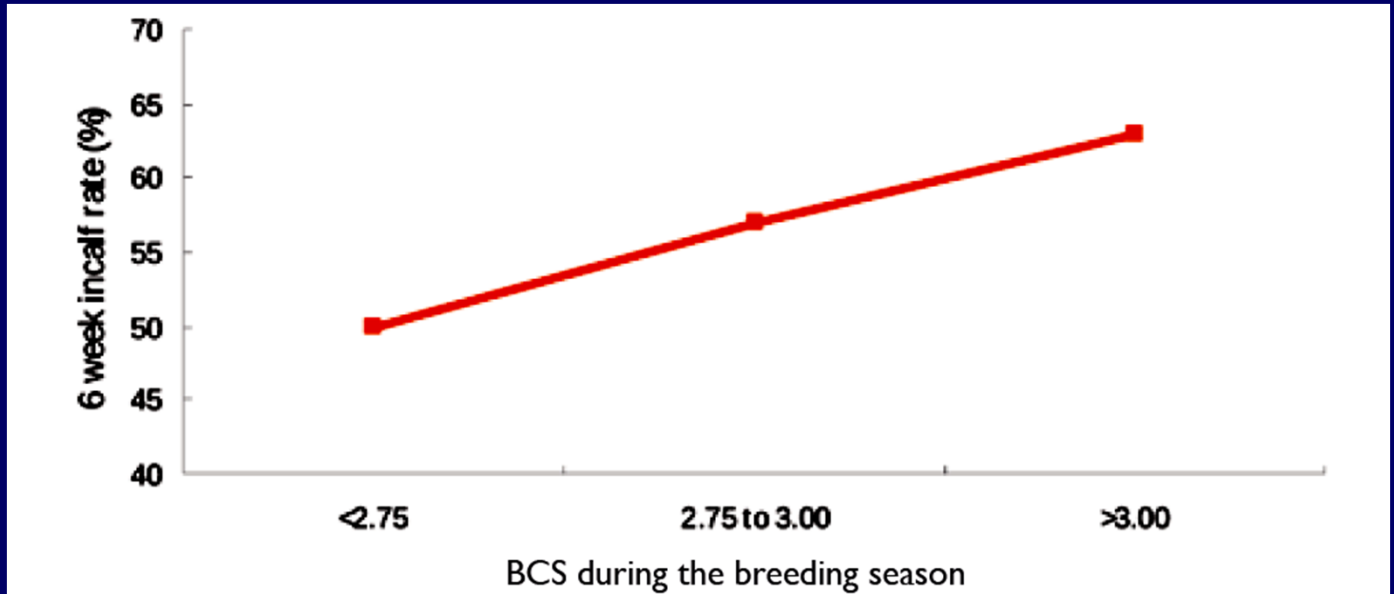


Figure 1. Association between body condition score during the breeding season and six week incalf rate.

BCS <2.75 (60-100 D of lactation/ breeding period)
… lower (P<0.01) CR BCS 2.75- 3.00

BCS >3.00 (60-100 D of lactation)
… higher CR then 2.75 to 3.00 category.

Nadir BCS

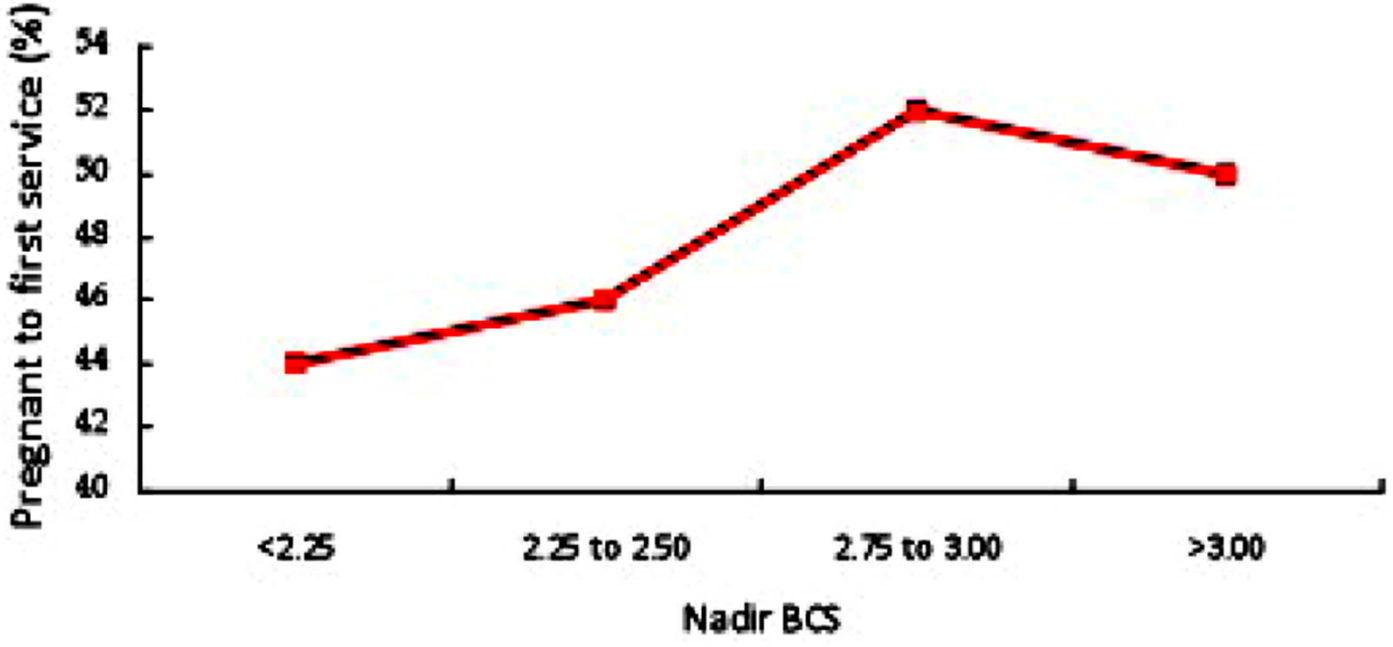


Figure 2. Association between nadir body condition score and pregnancy rate to first service

Pregnancy rate to first service was most associated with nadir BCS. Cows that reached a very low BCS (2.50 or lower) had an eight percentage unit lower PRFS compared to those with a nadir BCS of 2.75 to 3.00 (Figure 2).

BCS loss post-calving

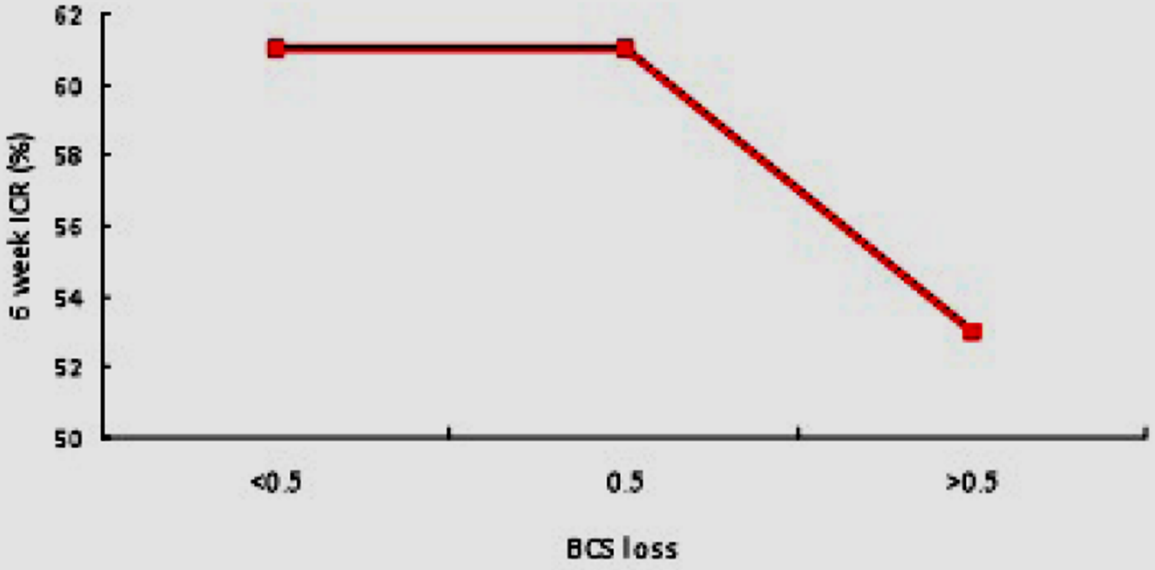


Figure 3. Association between body condition score change from pre-calving to start of breeding and 6 week incalf rate (for cows with a pre-calving body condition score of >3.00)

Cows experiencing excessive losses in BCS
(>0.5 units of BCS)
between pre-calving & start of breeding season
had a reduction in six week CR of 8.00 % units as compared to cows losing up to 0.5 units of BCS (Figure 3).

Table 2. Effect of time of AI on fertility of beef cows (adapted from Trimberger and Davis, 1943)

Time of AI	Number of breedings	Conception rate (%)
Start of estrus	25	44
Middle of estrus	40	82
End of estrus	40	75
Hours after the end of estrus		
6	40	36
12	25	32
18	25	28
24	25	12
36	25	8
48	25	0

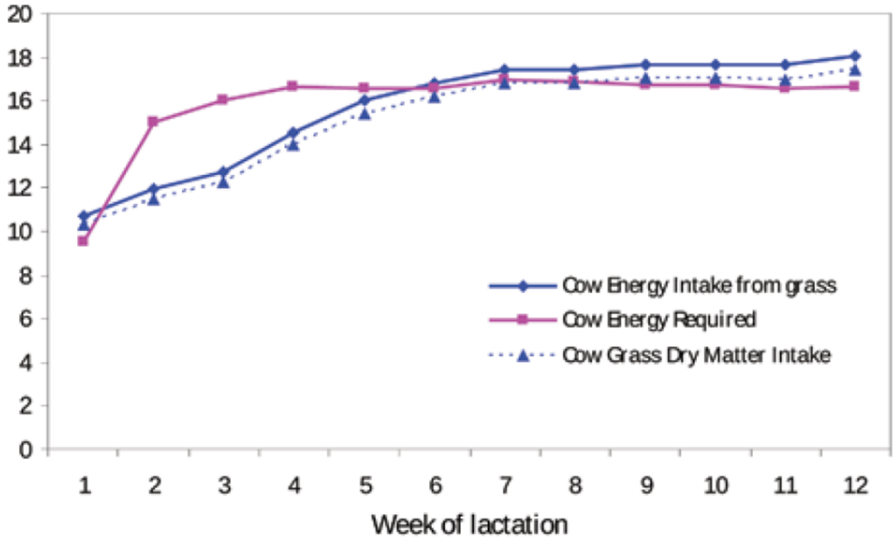


Figure 4. Dairy cow grass dry matter intake, energy intake and energy requirement in early lactation

Nutrition of the lactating cow

A number of factors can affect BCS, and one of the most important factors is DMI. Dry matter intake is also a critically important factor influencing milk production and fertility in dairy cows. Meeting the nutrient requirements of the animal by achieving the correct DMI is vitally important, and will allow the cow to display good production, health and reproductive performance.

Early lactation intake

The DMI capacity of dairy cows in early lactation is low. Data collected at Moorepark during the last five years from cows offered a grass-only diet clearly indicate the low grass intake of cows in early lactation. In the first week after calving in spring, grass DMI in a mature cow is just over 10 kg/day, and then increases by approximately 1 kg/week up to week eight (Figure 4). Grass DMI then levels off at 16 to 18 kg DM/day. First lactation animals consume on average 75 per cent the quantity of feed of their mature cow counterparts.

Cow Factors That Influence Success

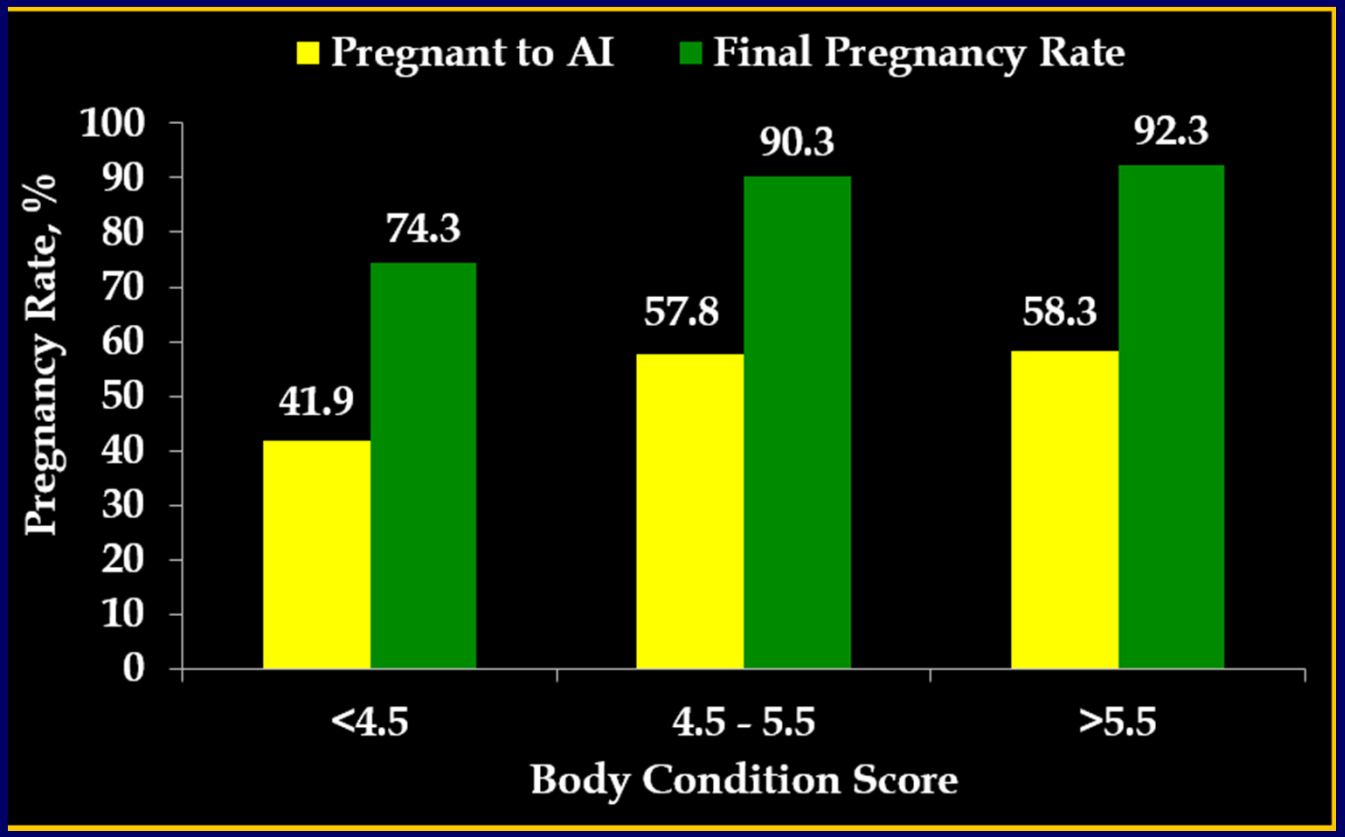


Figure 1. The impact of body condition score at the time of breeding on pregnancy rate with AI and season-ending pregnancy rates.

Reproductive Tract Scores in Heifers

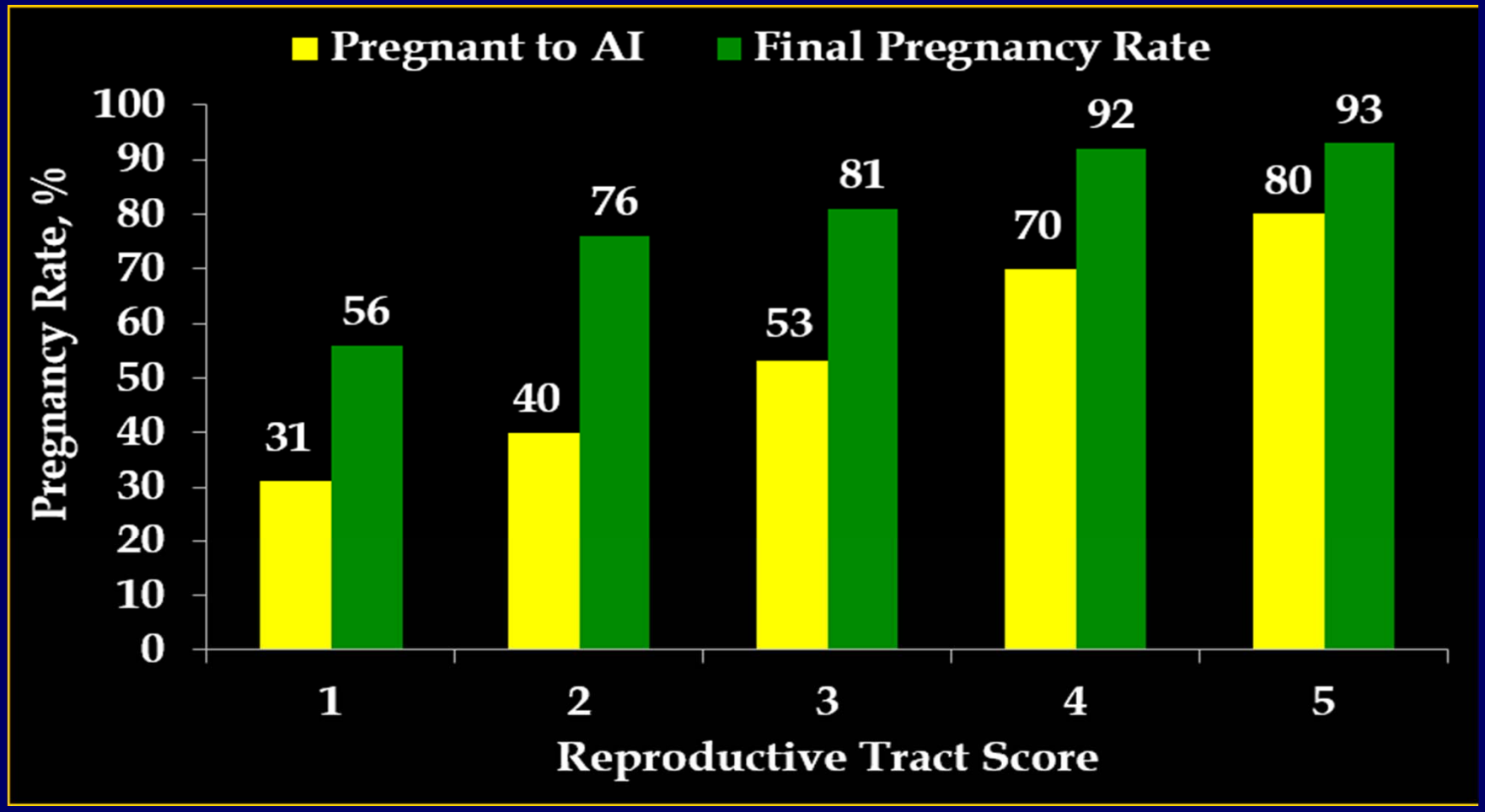


Figure 2. The impact of reproductive tract score on pregnancy rate with AI and season-ending pregnancy rates in heifers.

Table 6. Effect of sequence of insemination on conception rates after simultaneous thawing of fourn 0.5-mL straws of semen by professional AI technicians and herdsmen-inseminators (Adapted from Dalton et al., 2004).

	Conception rate[1] (%)				
	Sequence of insemination				
Inseminator	1st straw	2nd straw	3rd straw	4th straw	Mean
AI technicians	40 (61/153)	47 (71/150)	41 (60/146)	50 (74/147)	45[a] (266/596)
Herdsmen	24 (26/108)	20 (21/103)	33 (36/110)	30 (33/108)	27[b] (116/429)

[a,b]Means with different superscripts differ (P<0.01).

[1]Within inseminator category, no differences were detected due to sequence of insemination.

Table 2. Description of uterine and ovarian measurements for different reproductive tract scores (RTS).

RTS	Uterine horns (diameter, mm)	Ovarian length (mm)	Ovarian height (mm)	Ovarian width (mm)	Ovarian structures
1	Immature, < 20 mm, no tone	15	10	8	No palpable follicles
2	20-25 mm no tone	18	12	10	8 mm follicles
3	20-25 mm slight tone	22	15	10	8-10 mm follicles
4	30 mm good tone	30	16	12	> 10 mm follicles, CL possible
5	> 30 mm	> 32	20	15	CL present

Table 3. Time of day when cows exhibit standing estrus.

Time of day	Cows exhibiting standing estrus
6 a.m. to 12 noon	26.0 %
12 noon to 6 p.m.	18.1 %
6 p.m. to midnight	26.9 %
Midnight to 6 a.m.	29.0 %

Data adapted from (Hurnik and King, 1987; Xu et al., 1998, G.A. Perry unpublished data).

Table 5. Duration of biological factors that affect the time of artificial insemination with frozen-thawed semen in cattle.

Biological factor	Duration
Duration of standing estrus	Highly variable but normally 12 to 15 hr
Time of the gonadotropin (LH) surge which initiates the ovulatory process	Begins around the onset of standing estrus and lasts a few hours
Time from the LH surge to ovulation	25 to 30 hr
Lifespan of the oocyte (egg)	8 to 10 hr
Lifespan of frozen-thawed semen in the female reproductive tract	Approximately 24 hr but can be variable among bulls
Duration of capacitation within the female tract	4 to 6 hr following insemination but may vary among bulls.
Lifespan of fertile (capacitated) sperm in the female tract	18 to 20 hr

Table (2) Effect of calving and post calving disorders on conception rate

Disorder	Incidence (%)	1st SCR* (%)
None	77	49
Difficult Calving	1	43
Retained Placenta	4	42
Uterine Infection	14	36
Cystic Ovaries	4	35

*SCR-Service per Conception Rate

Source: Smith (1982).

Table (3) The postpartum (pp) reproductive targets to be met to obtain high reproductive efficiency and the associated key risk factors affecting these targets

Reproductive process	Target to be achieved	Risk factors affecting targets
Normal uterine involution	Day 50pp	Dystocia, RFM , Uterine infection
Resumption of ovulation	90% by day 42	Loss of > 0.5 BSC unit, Low feed intake, Uterine health
High oestrous detection	85% per cycle	Infrequent checks, Sub-oestrus, High yield
High conception rate to AI	50% per breeding	Excess BCS loss, Prior uterine problems Low P4 days 4–7 of pregnancy

Source James (2006)

Bang. J. Anim. Sci. 2010, 39(1&2)

Table 1. Effect of different factors on conception rate of RCC

Factors	No. of observation	Conception rate (%)	P-Value for T-test
1. Age			
Heifer	31	64.52[b]	
1st Calved	22	72.73[c]	
2nd Calved	37	64.86[b]	P<0.05
3rd Calved	25	60.00[ab]	
4th or more Calved	15	53.33[a]	
Overall Cow	99	63.64	
2. Milk Production (kg) at AI period			
1.0-2.0	37	64.86	
2.0-3.0	46	63.04	P<0.34
3.0-Above	16	62.50	
3. Clear mucus at AI			
Absent	34	50.00[a]	P<0.05
Present	96	68.75[b]	
4. Time of Service (h) after onset of estrous			
6.0-10.0	34	50.00[a]	
10.-14.0	62	74.19[b]	P<0.05
14.0-Above	34	58.82[a]	
5. Thawing period (sec.) of straw at 37°C			
5.0-7.0	21	33.33[a]	
10.0-12.0	100	72.00[c]	P<0.01
15.0-17.0	9	44.44[b]	
6. Heating of insemination devices			
Yes	93	64.52	P<0.36
No	37	62.16	
7. Temperament of animal at AI			
Docile	73	68.49	P<0.18
Aggressive	57	56.14	
8. Semen placement at AI			
Body of uterus	86	67.44[b]	P<0.05
Middle of cervix	44	56.82[a]	
9. Health disorder			
None	111	70.27[b]	
Difficult calving	4	50.00	
Retained placenta	9	33.33	P<0.01
Uterine infection	4	25.00	
Cystic ovaries	2	0.00	
Overall disordered	19	31.57[a]	

[a,b,c] means with different superscripts are significantly different at P<0.01

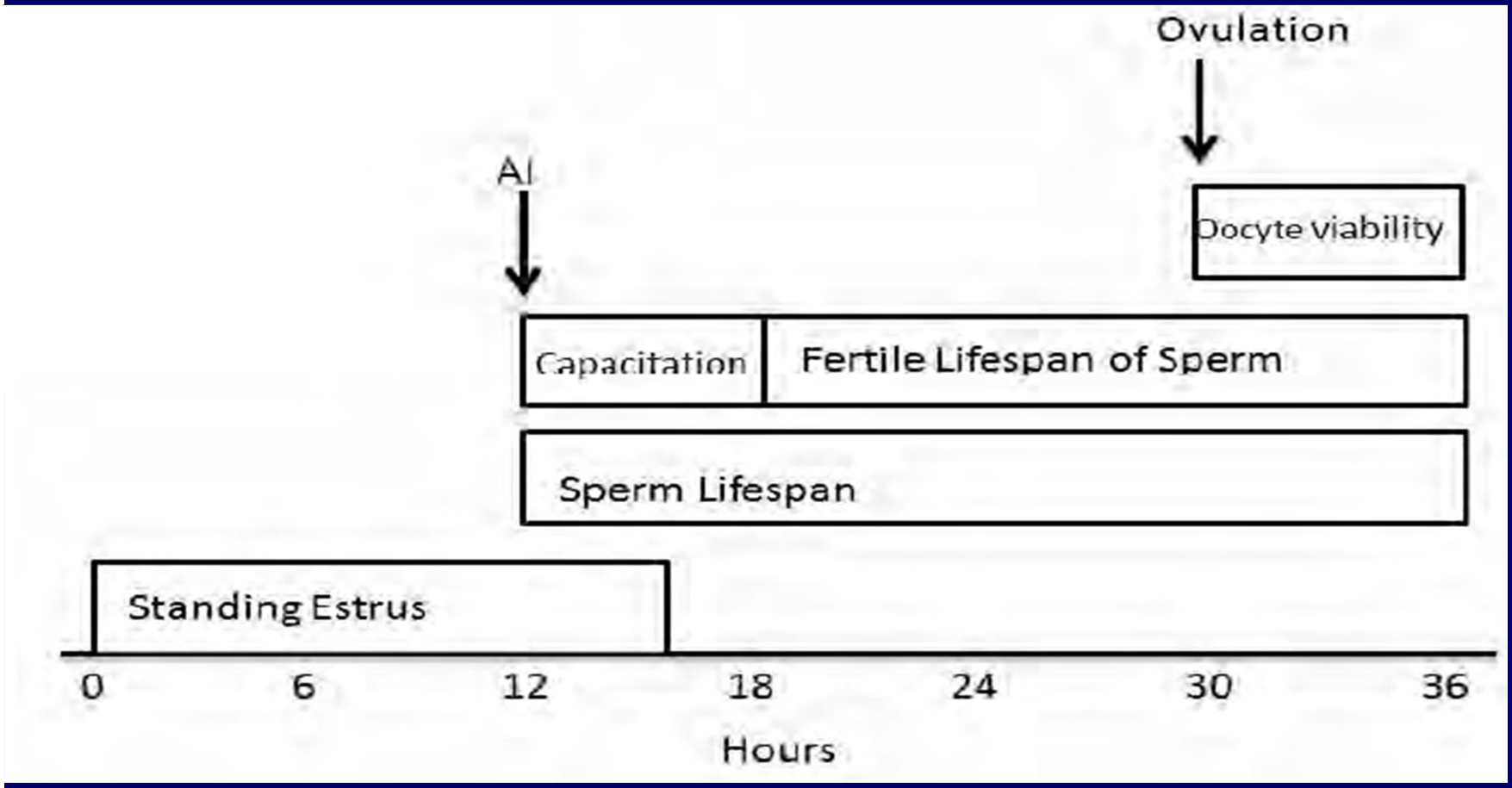


Figure 7. Illustration of the relationship among duration of estrus, duration of the sperm lifespan,
length of capacitation, duration of fertile lifespan of sperm, time of ovulation, and duration of
oocyte lifespan. Time periods are based on data from table 5.

likely bred about 18 hr after the onset of heat
or approximately 6 to 12 hr
before ovulation.

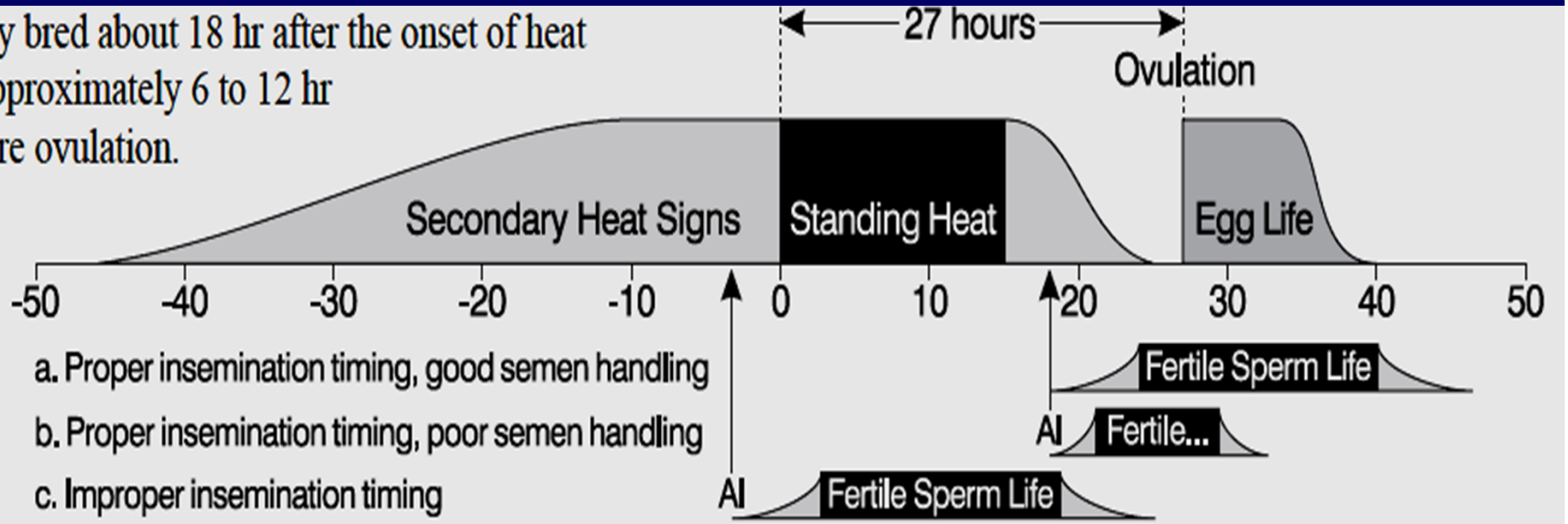


Figure 1 : Time scale summary of physiological events associated with estrus and AI timing.

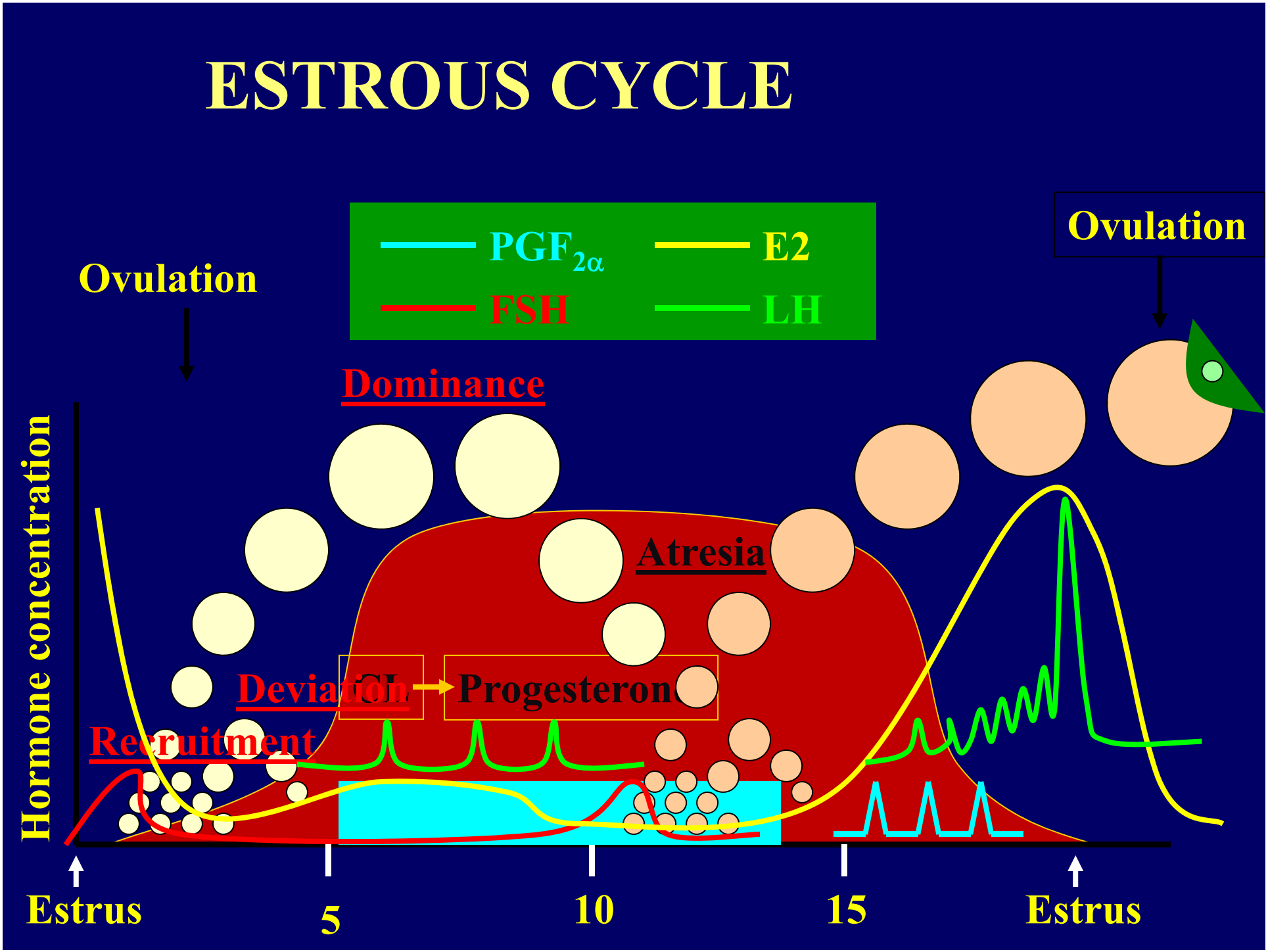
Cycle number	Days in Milk	# of Eligible Cows (cow cycles)	# of Heats Serviced	Breeding Submis-sion Rate	# of Preg-nancies	Conception Rate (CR)	Pregnancy Rate (PR)
1	50-70	100	56	56%	20	36%	20%
2	71-91	80	63	79%	22	35%	28%
3	92-112	58	36	62%	13	36%	22%
4	113-133	45	25	56%	8	32%	18%
5	134-154	37	21	57%	6	29%	16%
6	155-175	31	17	55%	5	29%	16%
7	176-196	26	14	54%	3	21%	12%
8	197-217	23	12	52%	3	25%	13%
9	218-238	20	10	50%	3	30%	15%
10	239-259	17	9	53%	2	22%	12%
11	260-280	15	7	47%	2	29%	13%
12	281-301	17	8	47%	2	25%	12%
		469	**278**	**59.3%**	**89**	**32%**	**19%**

Sample pregnancy rate calculation for an imaginary 100 cows dairy that continues breeding cows until 301 days in milk with a voluntary period of 50 days

Table 1. Effect of time of day and temperature humidity index on pregnancy success in beef cows

	Breeding Group	
Item	**Early**	**Late**
Start time	7:45	9:52
End time	9:50	noon
Temp. humidity Index*	75.9	78.7
Number pregnant	32 of 52	20 of 52
Pregnancy rate, %	61.5	38.5

* Temperature humidity index at 72 = physical signs of heat stress; at 86 = severe heat stress


ESTROUS CYCLE
PGF2α
E2
FSH
LH
Ovulation
Ovulation
Dominance
Atresia
Deviation
CL
Progesteron
Recruitment
Hormone concentration
Estrus
5
10
15
Estrus

Incentives (?) for increasing Pregnancy Rate

- Good reproduction starts with healthy fresh cow
- Fresh cow management
- Structured monitoring & Treatment Programme
- Dairy breeders face

  … Locating the cow/buffalo in estrus (accurate/intensive)

  … placing the semen successfully in these cows

  … health problems (lameness, anoestrus, mastitis, endometritis)

  … Critical factors (Calving difficulty, ROP, Metritis, Ketosis)

  … Excessive weight loss (early postpartum period)
- Poor heat detection, lower CR & Higher risk of EED

Remarks

- Alertness required by ……

  Veterinary professionals,

  AI technicians

  Policy makers

  Employers

  Others involved directly / indirectly in dairy animals breeding services inputs

- To what extent the damage is being imposed to the poor dairy farmers of the state and the nation

Thank You