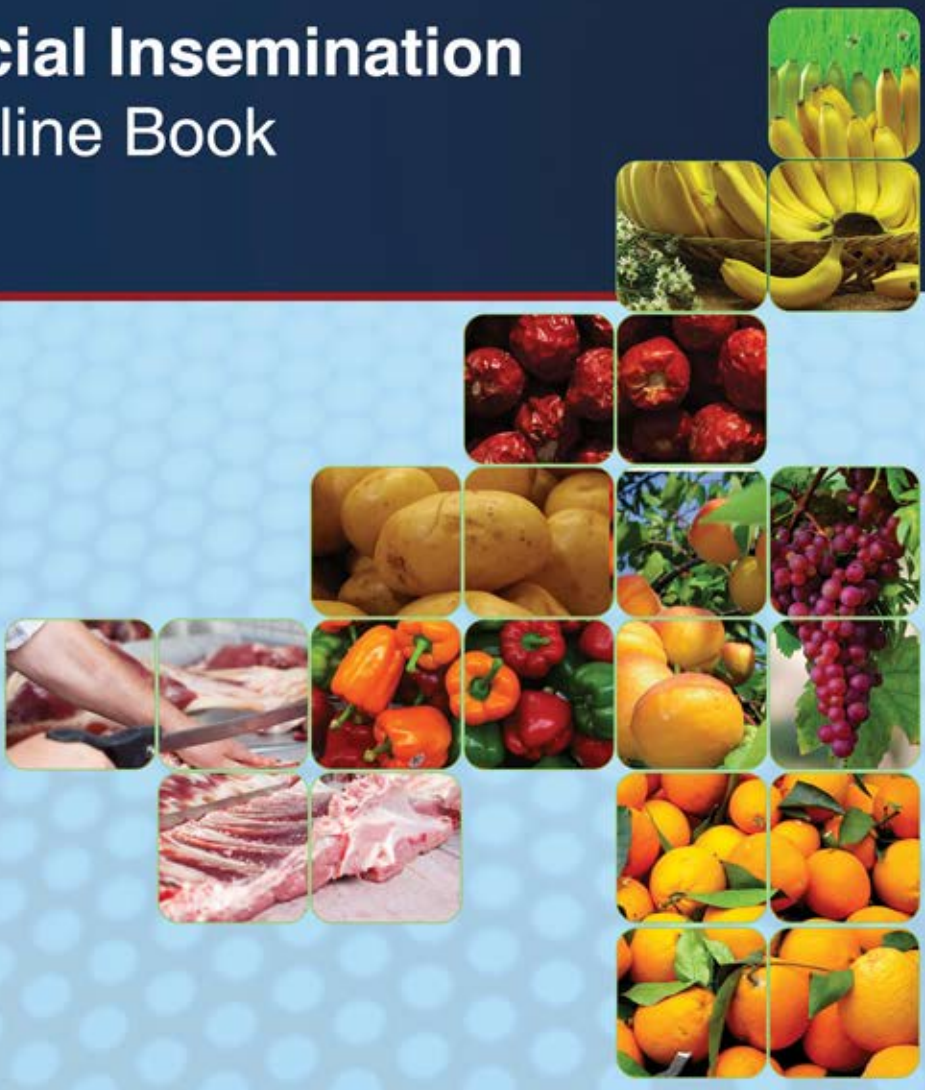
Together we will create a Roshan Pakistan

Artificial Insemination
Guideline Book



The Agribusiness Project - Agribusiness Support Fund
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Artificial Insemination Guideline Book

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This manual is a live document which can be changed/updated as the project progresses. Any suggestions for further improvement are most welcome.

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FOREWORD

A series of Training manuals , Guide Books and Reports have been developed by The Agribusiness Project (TAP) to facilitate the capacity building of farmers involved in TAP's targeted value chains, thereby enabling them to make the requisite transformation from 'subsistence farming' to 'farming as a business enterprise'. The Agribusiness Project is funded by USAID|Pakistan, with the overall goal of supporting improved conditions for broad-based economic growth, enhance profitability and employment opportunities and contributing to poverty alleviation through product and process transformation of selected value chains in horticulture and livestock sub-sectors." The strategy of TAP focuses on:

1. strengthening capacities in horticultural and livestock value chains to increase sales to domestic and foreign markets;

2. strengthening the capacity of smallholders (through farmer enterprise groups-FEGs), individual farmers and agribusinesses to operate effectively and efficiently; and,

3. increasing productivity and profitability through adoption of new techniques and technological innovations (among farmers, agribusinesses and business development services providers).

Through TAP, farmers have been organized as Farmer Enterprise Groups (FEGs) for cultivating the benefits of scale, through optimized production and marketing, and serving as a vehicle for transferring of the benefits of TAP interventions to its stakeholders - the farmers. TAP is providing active support to the FEGs and farmers for improving small producers' positioning in a value chain through support in incorporating producers and their product into stable, profitable market channels, and provision of necessary services and assistance in business development, planning and marketing through inter-linkages. This requires intensive capacity building of the stakeholders placing capacity building at the heart of all interventions.

This report/Manual can be used by anyone involved with the production, cultivation, harvesting and enterprise development training of and for farmers/farmer business groups. The contents have been finalized with the consultation of stakeholders engaged with the value chains.

While these Reports/Manuals/Guide Books are project specific and for a farmer audience, they can also be used for the capacity building of government and non-government agency representatives, processors and exporters who are involved in implementing production/cultivation, enterprise development and value chain programs, through the communities. Finally, I want to thank USAID|Pakistan for funding The Agribusiness Project under which this intellectual capital has been prepared. I would also like to thank ASF for successfully implementing these manuals/guide books across Pakistan for the benefits accrued to the farmers.

Shad Muhammad
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THE AGRIBUSINESS SUPPORT FUND

ASF is a 'not-for-profit' company registered under Section 42 of the Companies' Ordinance 1984 with Securities & Exchange Commission of Pakistan (SECP). ASF has extensive experience in strengthening and supporting demand-driven private sector service delivery mechanisms throughout the agribusiness value chain this includes supply inputs, production and export markets ASF aims to achieve this objective by mobilizing angel investment grant provision and technical assistance support of farmer and agribusiness enterprises. The company supports start-ups as well as existing enterprises, enabling them to employ modern technique and practices and build expertise and markets understanding required by a fast-changing economic environment and to improve their productivity, profitability, competitiveness and creditworthiness

THE AGRIBUSINESS PROJECT

The Agribusiness Project is an initiative of the United States Agency for International Development (USAID) and the Agribusiness Support Fund (ASF) Pakistan .the project aims at enhancing competitiveness of agricultural value chains in Pakistan, with a focus on Horticulture and Livestock including dairy, meat and fisheries. The objective of The Agricultural Project is to support and create improved conditions for poverty alleviation. Since Pakistan's economy is agrarian in nature, The Agribusiness Project aims to invest in interventions at the primary, secondary and tertiary levels of production. Under the International Market Access Program (IMAP), the project supports the creations of linkages between exporters and importers. The objective is to facilitate market access and enable trading linkages which translates into agribusiness through trade.

PREFACE

Agribusiness Support Fund (ASF) is a not-for-profit company incorporated under section 42 of the Companies Ordinance 1984. ASF is currently implementing a 5-year USAID's Agribusiness Project (UAP) with the overall goal to support improved conditions for broad-based economic growth, create employment opportunities and contribute to poverty alleviation through increase in competitiveness of horticulture and livestock value chains. The improper management and genetic drain generation by generation are mainly affecting the growth of livestock sector. Elite blood is being eliminated in the country. With less expenditure we can rapidly improve breeds through Artificial Insemination.

The purpose of this handbook is to give an insight to our dairy farmers, veterinary assistants and veterinary officers about the basic principles and protocols of Artificial Insemination so that while practicing Artificial Insemination in the field all these protocols are strictly considered to get optimum benefit.

ARTIFICIAL INSEMINATION

Artificial insemination is a technique by which semen is collected from bull in artificial vagina, processed and introduced into the body of the uterus at the time of heat in an attempt to cause pregnancy.

Merits of Artificial Insemination

1. Use of elite bulls semen for thousands of cows and buffaloes to impregnate them
2. It minimizes the risk of spreading sexually transmitted diseases and genetic defects
3. Reduces the cost of rearing bulls at farms
4. Conservation of rare breeds or endangered species

Requirements of Artificial Insemination

1. Proper heat detection and insemination time
2. Proper handling and preservation of semen
3. Availability of experienced inseminator

APPROPRIATE BREEDING PRACTICE

1. For plain belt/area one should recommend the cross breeding of Friesian bull with local cows
2. Whereas, for hilly terrain Jersey bull is recommended to be crossed with local cows

Friesian Cross Local


Jersey Cross Local


Comparison of Artificial Insemination with Natural Breeding

Natural Breeding		Artificial Insemination	
1	One bull being only able to cover round about 30 females in a breeding season	1	Semen of one bull can be used for at-least 15000 cows
2	The expense of rearing a bull is quite high at farms	2	With low cost the semen of elite bull is available
3	Because of non-affordability of rearing bulls, most of elite breeds are getting endangered.	3	Helps in conservation of endangered breeds
4	Maximizes the risk of spreading sexually transmitted diseases and genetic defects	4	Minimizes the risk of spreading sexually transmitted diseases and genetic defects
5	Elite animal sometime gets unable to mate due to injury	5	The same injured elite bull can be used for AI


Outcome of Natural Breeding Vs Artificial Insemination

Selection of Bulls for Artificial Insemination

Following characters should be kept in mind during the selection of bulls for artificial insemination.
1. Bulls is healthy and fit
2. Shinyeyes
3. Normal exercise and roaming
4. Intakeanddigestionisproper
5. Docileandfriendly
6. Bull doesn't have bad habits like kicking, etc.
7. HighLibido(desireformating)
8. Propermatingability
9. Proper sized sexual organs
10. Circumference of testes is not less than 34 centimeter
11. Sperm motility is not less than 60%
12. Doesn't have any inherited disease
13. Dam of the bull possessed high producing ability
14. Dam of the bull possessed good udder, immunity and lactation length
15.The bull is progeny tested (based on the performance of his offspring record)

Duration of heat and Estrous cycle in cows and buffaloes

Animal	Age at Puberty (Months)	Duration of Heat (Hours)	Estrous Cycle (Days)
Local Cows	14-24	6-22	21
Cross bred Cows	9-22	6-36	21
Buffaloes	22-36	10-36	21
Sheep	8-12	02-42	16-17
Goats	8-10	20-48	20

Symptoms of Heat
1. Restlessnessofanimal
2. Decreasedintakeandregurgitation
3. DecreasedMilkproduction
4. SwollenandreddishcoloredVulva
5. Less but frequent urination
6. Dischargeoftransparentandthinmucous
7. Voice in most of cows but not in buffaloes, as buffaloes are silent heat animals
8. Animal allow others to mate them
9. Opened cervix

STAGES OF ESTRUS CYCLE

Pro-Estrous

1. Comparativelyenlargeduterus
2. Reddish layer of uterus
3. Dischargeofwhitishliquidfromitsbody
4. Voices of animals in some cases
5. If other animals attempt to mount, this animal doesn't permit

Estrous

1. Restlessnessofanimal
2. Decreasedintakeandregurgitation
3. Decreased Milk production
4. SwollenandreddishcoloredVulva
5. Less but frequent urination
6. Dischargeoftransparentandthinmucous
7. Voice in most of cows but not in buffaloes, as buffaloes are silent heat animals
8. Animal allow others to mate them
9. Openedcervix
10. This phase remains for around 24 hours

Met estrous

1. Ovulationoccurs
2. Heatsymptomsareover
3. Animals does not allow mating
4. Thisphaseremainsfor6to7days

Di Estrous

1. This is the phase between two estrous
2. The color of vagina gets faded
3. Organs get shrink
4. Cervixclosed
5. In non-pregnant animals this phase remains for 13 days

RECTAL EXAMINATION IN CATTLE AND BUFFALOES

Rectal examination is a simple but authenticated process to examine the reproductive organs. The rest of the procedures requires technical expertise as well as expenses.

STEPS FOR RECTAL PALPATION

1. Restrain the animal properly
2. Wear dungry and rubber boots
3. Put a glove on left arm and lubricate it with oil or non toxic soap
4. Make a cone type shape of your hand and insert it in rectum
5. Pulloutallthedungfromrectumgently
6. Pull out the dung but do not pull out your hand from rectum

ARTIFICIAL INSEMINATION IN CATTLE AND BUFFALOES

Following points should be ensured to practice Artificial Insemination.

1. Tools required for AI are in place
2. Steps to be followed for AI are observed
3. Proper time for AI
4. All the protocols are strictly followed

A. Tools required for AI are.

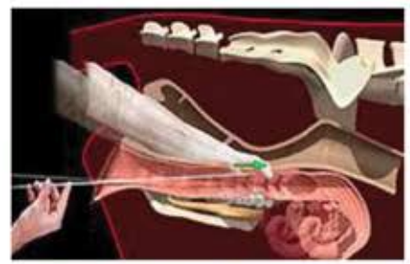
i. Liquid Nitrogen Container
ii. Canister
iii. Goblet
iv. Straw
v. AI gun
vi. Affiliated tools
  a. Thawing pot
  b. AIsheath
  c. Scissors
  d. Forceps
  e. AIgloves
  f. Apron
  g. Gumboots
  h. Tissuepaper
  i. Thermometer

PREGNANCY DIAGNOSIS

For a profitable farming, the pregnancy diagnosis in early days is very important. If animal is found non-pregnant she should be again impregnated. For pregnancy diagnosis rectal palpation is being used since long which is simplest and authenticated. If the animal does not show heat symptoms after insemination it is a sign of impregnation. Similarly sometime pregnant animals also show heat symptoms. After insemination the heat symptoms whether shown or not does not mean that animal has conceived. There might be chances of misconception. The only authenticity can be done with rectal palpation. The gestation in cows are 284 days whereas in buffaloes are 308 days.

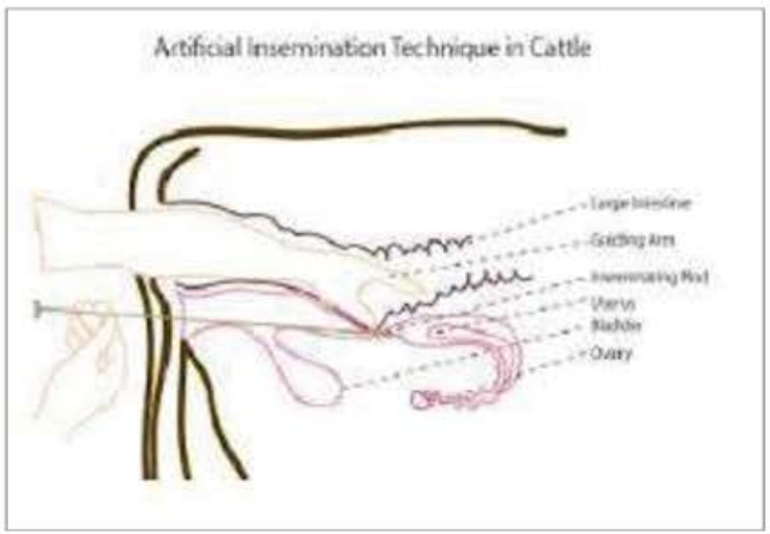
SEMEN HANDLING CHECKLIST

1. Store the Liquid Nitrogen (LN2) tank in a location that allows you to see clearly into the neck tube and is dust-free and dry.
2. Measure LN2 weekly; level should not drop below 3 inches (8 cm)
3. Maintain an accurate semen inventory to lessen the risk of semen exposure.
4. Raise the canister just high enough to grasp the top of the cane with a tweezers – 5 inches (12.5 cm) from top of tank.
5. To maintain semen quality, do not allow the canister or cane to remain in the raised portion in the neck tube for more than 10sec.
6. Genex semen can be thawed using warm water, place the straw immediately in a warm water bath, at a temperature 32-35 degrees Celsius for a minimum of 40 seconds.
7. Semen should be placed into the cow as quickly as possible (within 15 minutes after it is removed from the tank).
8. The straw should be handled by the tweezers not the fingers.
9. To protect the thawed semen, place the insemination straw into a folded paper towel.
10. Dry the straw and check for proper sire identification before loading the gun. Note: Load only one gun at a time.
11. Prepare removal of sheath through the reseal able end of the sheath
12. Warm the gun prior to placing the insemination straw inside.
13. After the insemination straw is loaded into the insemination gun, make a clean, straight cut at a right angle
14. Wipe the cutting edge of the scissors with a paper towel, to prevent future straw contamination.
15. Place the sheath over the insemination gun, seat the straw in the sheath tip and secure it into place.
16. Prime the insemination gun by pushing the plunger until semen is moved to the end of the sheath.
17. Place the loaded insemination gun in a clean plastic glove and then inside your clothing to transport to the cow.

INSEMINATION TECHNIQUE CHECKLIST

18. Use a new glove for every insemination.
19. Lubricate the glove with clean, non-toxic lubricant.
20. Speak to the animal to make her aware of your presence.
21. Lubricate the anus with gloved hand.
22. Gently enter the rectum by forming a cone with your fingers. Gently and thoroughly clean the rectum of manure.
23. Check the reproductive tract for any abnormal conditions.
24. Clean manure from vulva & underside of your arm with a paper towel.
25. Gently & smoothly pass the gun through vagina to the opening of cervical canal
26. Funnel the tip of the gun into the cervical os.
27. Hold the cervix ahead of the gun's tip and manipulate the cervical folds or "rings" to allow the gun to pass.
28. Avoid passing the gun through the cervix if pregnancy is suspected.
29. Determine the length of the cervix and place your index finger at the uterine end of the cervix.
30. Gently move the gun tip forward until you feel it with your finger.
31. Pass the gun tip only as far forward as the uterine body of the cervix.
32. Be certain the gun tip is not caught in area between cervical rings.
33. Concentrate on accurate semen placement.
34. Firmly hold the cervix.
35. Place your right fingers against your left arm to ensure the gun is not pulled back, into the cervix, during semen deposit.
36. Deposit the semen into the uterine body; slowly (5 secs.)
37. If the animal moves, STOP! Wait until movement stops
38. Gently remove the gun and complete semen deposit.
39. Record when, and to what sire, the animal was bred.



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