

First TOT on Fresh Boar Semen AI in Nepal

A completion report in brief

Dr Nanda Prasad Shrestha and Dan B Singh

2016-01-31



Training date: 12 Jan - 17 Jan 2016

Venue: Pokhara Livestock Pvt Ltd, Lekhnath Municipality-2, Kaski

Collaborators: NARC, DLS, PLPL, SGI, and Samarth-NMDP

Background

Artificial insemination in pigs is potentially a very hygienic and effective means for fertilization and conception. It eliminates the possible transfer of infection from direct contact with the boar. On the other hand artificial insemination (AI) services when readily accessible, it can help reducing the cost of keeping boars and increasing farmers' profit. Moreover, Artificial insemination in pig is the quicker way of improving the genetic worth and efficient means for enhancing productivity and income.

Samarth-NMDP has collaborated in partnership with all five GPS farms in Nepal to initiate and strengthen artificial insemination in pigs with frozen boar semen imported from Swine Genetic International, USA. AI in pig with frozen boar semen has been continuing since two years and a number of quality pigs have been produced by AI and raised for replacement as future breeding stock. However, it would take long time to get benefits from superior pigs by smallholders due to their limited access to GPS farms for AI born piglets, higher price of weaners and also owing to lower reproductive efficiency with frozen semen AI.

AI services with fresh semen from superior boars can play a significant role for a rapid dissemination of superior genes in commercial as well as smallholder pig herds, as other countries have been successfully embracing this practice since decades.

To initiate Fresh Boar Semen AI and develop the technology in Nepal, SAMARTH-NMDP is partnering with DLS and NARC and three GPS farms who at present are carrying out the frozen semen AI. These GPS farms have the capacity to initiate fresh semen AI at the farm and can also sell the semen and services to smallholders.

Samarth-NMDP in collaboration with three partner GPS farms imported the lab equipment, accessories and consumables from Swine Genetics International, US to initiate fresh semen AI in near future. SGI agreed to send an expert as a resource person for setup of the AI lab and to share his expertise in boar training, semen collection, evaluation, extending and storage of boar semen and performing insemination with fresh extended semen.

The fresh boar semen AI in pig is a new initiative for Nepal, therefore, Samarth-NMDP pig subsector has organized a trainers' training event in collaboration with DLS, NARC, private GPS farm (Pokhara Livestock Pvt Ltd), SGI, US with the following objectives.

Objectives

1. To build the capacity of GPS partners on boar training, semen collection, processing, storage and transportation to render AI services to farmers.
2. Building capacity of NARC and DLS Officers and technicians to serve as a trainer for fresh semen AI in pig.
3. To share the knowledge on the essential equipment, their function and use and routine maintenance.
4. To learn about the setup and installation procedures of newly imported equipment and accessories in AI lab.
5. To learn and adopt the standard operating procedures of AI lab.

Training of Trainers (TOT) accomplished

The TOT was organized for six working days that commenced on 12 Jan and concluded on 17 Jan, 2016 in Pokhara. The theory sessions were conducted in Crown Himalayas whereas the practical sessions and lab work were carried out in Pokhara Livestock Pvt Ltd (PLPL), one of the SAMARTH'S partner GPS farms located in Lekhnath municipality-2, Rithepani, Kaski.

In total nineteen participants that comprised of GPS farm owners and staffs, DLS officers, NARC Scientists, Technical staffs and Sector Analysts from Samarth have actively participated in the first TOT in Nepal on fresh boar semen production, processing and artificial insemination. Among nineteen participants five were the women participants from NARC, private GPS and DLS that has made the women participation of 26 percent. Ten resource persons and experts from DLS, NARC, Swine Genetic International and Samarth have valuable contribution in successful completion of TOT.

Name list of resource persons contributed in TOT:

SN	Name	Organisation	Position	Address
1	Dr Kevin Rozeboom	SGI-GENEPro	Expert	USA
2	Mr Damodar Neupane	SARP-NARC	Chief	Khumaltar
3	Mr Bholu Shankhar Shrestha	ADB-NARC	Chief	Khumaltar
4	Dr Deo Nandan Sah	RDLS-DLS	Reg. Director	Pokhara
5	Dr Pradeep Chandra Bhattarai	CPPPO-DLS	Chief	Lalitpur
6	Mr Rudra Prasad Poudel	NLBC-DLS	Chief	Pokhara
7	Dr Khagendra Raj Sapkota	NLBC-DLS	Vet Officer	Pokhara
8	Dr Nanda Prasad Shrestha	CEAPRED-Samarth	Project Manager	Kathmandu
9	Dr Bhoj Raj Joshi	CEAPRED-Samarth	Liasion Manager	Kathmandu
10	Mr Dan Bahadur Singh	CEAPRED-Samarth	Tech. Coordinator	Kathmandu

Training course outline and the resource persons:

12 Jan

1. Anatomy of the boar and sows' reproductive system-Dr. Khagendra Sapkota, DB Singh
2. Reproductive physiology of the boar and sow- Dr.Pradip Chandra Bhattarai
3. Boar training, exposing to dummy Mr. Rudra Prasad Paudel, DB Singh
4. Farm bio-security in fresh semen AI practices Dr. Deo Nandan Sah,

13 Jan

5. Selection criteria of young boars for semen collection- Mr. Bholu Shankar Shrestha
6. Disease screening, Clean herd maintenance and adoption of bio-security measures in GPS Herds; Dr. BR Joshi
7. Housing for stud boars, dummy types and semen extraction methods-DB Singh, Dr Nanda
8. Standard Operating Procedure in fresh boar semen processing, storage, transport by Dr. Kevin Rozbooms, Dr Nanda

14 Jan

9. Use of lab equipment for collection, processing, packaging, storage & transport of fresh semen by Dr. Kevin, DB Singh

10. Practice of boar semen collection, evaluation, processing and packaging by trainees guided by Dr Kevin
11. Management of semen production schedule, synchronizing sow heat at field level. By Dr. Kevin. Dr Nanda
12. Good management practices in fresh boar semen AI including personal hygiene and sanitation. By Dr. Kevin, Dr Nanda

15 Jan

13. Semen collection, processing, evaluation, storage of semen methods by Dr. Kevin
14. Exposing boars to dummy sow. Assisting boars to mount, semen collection procedures by Kevin
15. Characteristics of boar semen and evaluation. Use of semen processing equipment By Dr. Kevin, DB Singh
16. Practice boar semen collection and evaluation by participants guided by Dr. Kevin, DB Singh, Dr Nanda

16 Jan

17. Boar semen extension-use of extenders/diluents, packaging and storage of extended semen by Dr. Kevin
18. Preparation for boar semen collection and practice by participants. guided by Dr Kevin, DB Singh, Dr Nanda
19. Transportation of fresh boar semen to various districts, and providing AI services in smaller herds- Dr. Kevin, DB Singh, Dr Nanda
20. Practical demonstration on AI in pigs with fresh boar semen (gilts/sows) By Dr. Kevin, DB Singh

17 Jan

21. Interaction on fresh semen A.I. in pig especially in smaller pig herds - Dr. Nanda
22. Future prospects of fresh boar semen AI in Pig in Nepal- Damodar Neupane, Chief Guest, SARP-NARC
23. Review, certificate distribution and Closing- Mr Rudra Poudel, NLBC Chaired the closing session

Practical Sessions organized at PLPL for participants' skill development and practice:

- Dr Khagendra Raj Sapkota discussed on the anatomy of boar and sows reproductive system using multimedia and reproductive organs brought from a local butcher, illustrated the parts name and their functions. Later each of the trainees practice to label the parts of reproductive system and described the function.
- About two weeks prior to training eight young boars had been selected and housed separately in individual pens to use them for the training practice. Four of them were exposed to dummy, trained to mount and semen was collected for three consecutive days and kept them at rest for the use in the training.



- Three additional dummy sows two from ABD, Khumaltar and one from LDF, Pokhara were brought to PLPL to practice training of four boars at the same time. The four untrained boars were exposed to dummy by the participants divided into four smaller groups. The participants observed the boars behavior, learnt to approach and encourage the boars to mount on the dummy sow.

- Dr Kevin demonstrated the techniques of training of inexperienced boar, exposing them to dummy sow and encouraging them to mount. On the very first day he was able to make the boar mount on dummy and collected him for the first time. The participants in groups also practiced the handling, moving and training the boars.



- Four semen collection cups were prepared by participants before the semen collection practical sessions started. These cups have to be pre-warmed to 35-37 degree C before taking them to barn. An electric bulb in a Styrofoam container may work for warming of the cups.

- The second day the groups were involved in training of boars and one group was able to collect semen from one boar. Dr Kevin and two other participants collected semen from previously trained boars to demonstrate the semen evaluation, processing and making fresh semen doses in the lab.



- Prior to collection work participants learnt to do required preparations, first of all extender preparation for extending semen. The outer jacket of vat mixture was filled with distilled water to the upper level and switched on the heater and set the regulator to 35 degree C.
- Five Litres of RO water taken in vat mixture with stirrer placed in the mixture. When the temp of water reached to 35 ° C, 600 grams of extender weighed on a lab scale and mixed with warm RO water with stirrer running. After 30 minutes the extender was ready to use for extending the fresh semen.

- Dr Kevin installed the software for printer and Metrosperm device, copied spread sheets to be used for sperm concentration records. He explained to use Metrosperm and computer connected with probe to measure the sperm concentration of an ejaculate, maintaining database and printing the labels.



- Participants learnt to estimate sperm motility percent, boar semen was observed under the microscope. The slide warmer was used to warm the glass slides and cover slips to 30° C for estimating the sperm motility percent.

- The ejaculates were weighed on scale to record volume, mixed with 50-100 ml of extender to keep sperm active and robust to bear shocks during extending. The sperm concentration and motility were recorded on the spreadsheet and used software to calculate the volume of extender to mix with ejaculate to make extended semen doses.

- Six semen tubes placed upright on tube holders and filled with 80 ml of extended semen and sealed them using sealing machine and the printed labels were stick on the semen tubes. The prepared semen doses were laid flatly in the semen storage unit at the temperature of 15 to 17 ° C. Semen tube should not be kept piling so as to avoid temperature rise. Moreover, the stored semen tubes should be slowly upturned at least twice daily so as to make the sperm dispersed in extended semen evenly since the sperms get settled at the bottom of tubes.



- The semen doses should be used within five days period preferably within three days to achieve best results (conception and litter size at birth).

- Dr Kevin explained a Styrofoam box or a picnic box with gel icepacks could be used for transportation of fresh semen maintaining the temperature inside the box to 17 °C.

- The participants practiced on the detection of sows in standing heat and four of them have been identified at PLPL on previous day. Dr Kevin demonstrated insemination technique using foam tipped catheters and the fresh semen tube. Participants also practiced the insemination of sows in heat with fresh semen.

- Every participant was involved in training boars, collection of boar semen and semen evaluation and extending the semen.
- The Duroc boar who was collected three times prior to the training was collected again but his semen did not show any sperm. Dr Kevin suggested that this boar should be monitored for five weeks to see the improvement.

On the last day of training Mr Damodar Neopane, Chief of SARC-NARC, the chief guest of the closing event gave the lecture on the "Future prospects of fresh boar semen AI in Pig in Nepal".

Participants' views:

In the closing session, three participants have shared their views on the successful completion of training. Mr Chhyam Thapa, Mr Sanjeep Rai the GPS farm owners and Dr Shobha Sharma, NLBC had the feeling that the training was educational, practical oriented and very well organized. They expressed that participants have learnt and improved their knowledge on training of boars, collection, evaluation and processing of boar semen. The participants could contribute as a resource person in future.

All three GPS farms, now can start fresh semen production and set up the lab. However, the screening of GPS herd for PRRS has to be done and segregate the clean herd to produce high quality fresh boar semen for dissemination.

Closing session:

The chief guest and chairperson of the closing session Mr Damodar Neopane and Mr Rudra Poudel, Chief NLBC congratulated the participants who have the opportunity to gain practical knowledge on fresh boar semen production and expressed his appreciation to Samarth who had collaborated in initiation of frozen boar semen AI in five GPS farms in previous years and now the fresh boar semen in three GPS herds of Nepal. They believe that the initiation of fresh boar semen AI services will be a major step on the road of pig industry development in Nepal. The certificate were distributed by the Chief Guest, Mr Damodar Neopane and Dr Kevin gave away a flash drive containing presentation files and photos of various activities.

Dr Kevin the expert from SGI-Genepro expressed his pleasure being in Nepal for this training and hoped for the continual linkage with pig producers and concerning agencies. He also stated the crucial part of AI being hygiene and sanitation to maintain together with the technical skills and interrupted power supply for semen storage. He praised the pig entrepreneurs for their

Dr Nanda Prasad Shrestha, the Project Manager, Samarth-CEAPRED has expressed the vote of thanks to Dr Kevin Rozboom from US and the resource persons of NARC and DLS who have provided their valuable contribution in making the training successful. He congratulated the participants for their keen interest in learning and practicing the techniques especially the women participants who were very enthusiastic to acquire the knowledge and skills. He suggested the GPS farms to speed up the process of developing clean pig herd and setting up of the lab equipment and selecting superior boars to produce fresh semen for wider dissemination.

The list of participnats:				
S.N.	Name of Participants	Address	Contact Number	Email Address
1	Mr. Chhyam Bahadur Thapa	PLPL, Lekhnath-2, Kaski	9851058603	pkr.livestock@gmail.com
2	Mr. Khim Bahadur Thapa	PLPL, Lekhnath-2, Kaski	9816601715	kthapapeace@gmail.com
3	Mr. Surya Bahadur Rana	PLPL, Lekhnath-2, Kaski	9846281961	
4	Mr. Sanjeep Kumar Rai	Kulung Bangur Farm, Topgachhi-5, Jhapa	9842682055	rsanjeep@gmail.com
5	Ms. Babita Khadka	Kulung Bangur Farm, Topgachhi-7, Jhapa	9842463995	
6	Mr. Diwas Rai	Kulung Bangur Farm, Topgachhi-7, Jhapa	9824095662	
7	Mr. Ram Deo Pandit	RARS, NARC, Tarhara, Sunsari	9842036605	ramdeopandit@yahoo.com
8	Mrs. Shakuntala Rai	RARS, NARC, Tarhara, Sunsari	9842102718	
9	Dr. Prakash Kumar Yadav	RARS, NARC, Tarhara, Sunsari	9808310492	drprakash473@gmail.com
10	Mr. Moti Ram Chaudhary	SARP, NARC, Khumaltar, Lalitpur	9898977950	cmotiram@ymail.com
11	Mrs. Ranjana K.C.	SARP, NARC, Khumaltar, Lalitpur	9843358171	ranjanakc23@gmail.com
12	Mr. Dipak Adhikari	SARP, NARC, Khumaltar, Lalitpur	9851174253	dipsagar95@gmail.com
13	Mr. Som Bahadur Gurung	LDF, Pokhara, Kaski	9846139941	g.sombah@gmail.com
14	Dr. Khagendra Raj Sapkota	NLBC, Pokhara, Kaski	9855060258	vet_khagendra@yahoo.com
15	Dr. Shobha Sharma	NLBC, Pokhara, Kaski	9845053920	shova15@hotmail.com
16	Mr. Moti Prasad Lamichhane	CPPPO, DLS, Hariharbhavan,	9846039162	lamichhanemoti45@gmail.com
17	Ms. Damar Kumari Rai	ABD, NARC, Khumaltar	9841459821	raidk2014@gmail.com
18	Dr. Rajesh K Chaudhary	Samarth-NMDP	9845038503	rajesh.chaudhary@samarth-nepal.com
19	Dr. Chatra Bahadur Chetry	Samarth-NMDP	9842547713	chatra.chetry@samarth-nepal.com



Women participation in the training

Glimpses of training



Tube containing 80 ml of fresh boar semen



Participants Inseminating sow using fresh semen



Token of appreciation awarded to Dr Kevin



Certificate distribution event



Practical sessions carried out in PLPL



Theory sessions conducted in Hotel Crown Himalaya



Certificate of participation

in First TOT on Boar Fresh Semen A.I. in Nepal
12 - 17 January, 2016

This certificate is awarded to; who has actively participated and involved in various processes of: (i) Boar training, (ii) Semen collection, (iii) Semen dilution and processing, (iv) Packaging and labelling, (v) Transportation and (vi) Performing artificial insemination in pig.

Mr. Damodar Neupane
Shrestha Coordinator
Advisor,
SARP, NARC

Mr. Rudra Prasad Paudel
Chief, NLBC, Lampatan

DLS

Dr. Kevin J. Rozeboom
Vice President of Operation

GENEPRO/ SGI, USA

Dr. Nanda Prasda
Livestock/Pig

Samarth/NMDP



Pokhara Livestock Pvt. Ltd. Rithepani, Lekhnath-2; Kaski



The PLPL owner Mr Chhyam Thapa presented the vote of thanks to Dr Kevin Rozeboom, SGI, US who has shared the knowledge and skills of fresh boar semen collection and processing in TOT on fresh boar semen AI



CPPPO-NLBC-DLS



RARS, Tarahara-SARP



First TOT on Boar Fresh Semen A.I. in Nepal

12 - 17 January, 2016

Hotel Crown Himalayas, Pokhara &
Pokhara Livestock Pvt. Ltd. Lekhnath, Kaski

