1. INTRODUCTION:

1.1) Historical Background:

Livestock development in Nepal is considered to have been initiated, with import of cows from UK, way back in 1917 B.S. by the then prime minister Jung Bahadur Rana. Since then, the high-ranking officials and ruling elites gradually started bringing exotic cows from India, and number of exotic cows in Kathmandu valley increased, as people close to ruling families followed them.

Livestock Improvement Section, with main objective of increasing genetic potentialities of indigenous cows was officially established in 2008 BS (1952 AD), and exotic breeds such as Red Sindhi, Sahiwaal, Jersey and Brown Swiss were used for "*grading-up*" of native cattle. As there were only small number of crossbred cows in Kathmandu valley, artificial insemination (AI) program with liquid semen was started in 2017/18 (1961/62). Thus, use of Red Sindhi, Sahiwaal, Jersey, Holstein and Brown Swiss liquid semen to up-grade native cattle came into practice, in the year 2018/19 (1962/63).

An *Artificial Insemination Project* was started at Tripureswor, Kathmandu in B.S. 2025/26 (1969/70), and AI program received further momentum after establishment of Liquid Nitrogen (LN_2) Plant in the year 2037/38 (1980/81). The Project was renamed as *Animal Breeding Division* (ABD) and was shifted to Khumaltar in the year 2041/42 (1985/86). The ABD initiated breeding activities in cattle, buffalo, sheep, goat, pig, and poultry with main emphasis on AI in cattle and buffalos. In 2046, when ABD became a part of Nepal Agriculture Research and Services Center (NARSC), the Department of Livestock Services (DLS) started AI program naming it *Artificial Insemination Services*. The Artificial Insemination Services was renamed *Animal Breeding and Artificial Insemination Program* in 2048/49 (1991/92) and was made a part of the Department of Agriculture Development (DoAD). With restructuring of the Agricultural Ministry and re-establishment of DLS in 2052/53 (1995/96) and the program was named as *Animal Breeding and Artificial Insemination Section.* The section was relocated to Lampatan, Pokhara in the year 2058/59 BS (2001/02 AD) with same name as *Animal Breeding and Artificial Insemination Section* and renamed *National Livestock Breeding Center* in 2061/62 (2004/05).

National Livestock Breeding Center (NLBC), located in Khumaltar, Lalitpur since last 18 years was relocated to Lampatan, Pokhara in the year 2058/59 BS (2001/02 AD), and has been functioning to achieve and meet its vision, goal and objectives. Recently, after the country entered into the federal system, the office has been functioning as National Animal Breeding Office since 2075/76 B.S.(2019 A.D.) with the mandate of overall "Animal Breed Improvement & Breeding Policy Formulation" under the Department of Livestock Services which also

integrates the then Livestock Development Farm, Pokhara to achieve the common Goal of Breed Improvement in the country.

On the other hand, the then Livestock Development Farm, Pokhara (locally popular as **Bhedi Farm**) was established in 1960 (2017/2018 BS) as Sheep Breeding Farm with the help of New Zealand Government. The project started crossbreeding Local Baruwal with exotic Polworth breed of sheep, but discontinued the practice as Baruwal from high hills could not thrive well at Lampatan, Pokhara. Then, Kage, another native breed of sheep was chosen for upgrading and attempts to improve quality and yield of its fleece and body weight were made. The New Zealand assistance ended in 1964.

In 1969, buffalo, pig, goat and poultry production units were initiated in addition to the sheep production unit and the farm was renamed Livestock Development Farm, Pokhara. The farm continues all the units, though the goat production unit was discontinued for a long period after few years. A financial and technical support by GTZ (German agency for technical co-operation) was provided through GADP (Gandaki Anchal Agriculture Development Project) for a period of six years from 1975 to 1980. All existing major farm facilities were developed during this period. The project helped to construct farm infrastructures and import farm machines, tillage equipment and exotic breeding animals from overseas. Objective of the farm then was research on production and production technologies and production and supply of improved genetic resources of livestock and forage planting materials.

The farm remained a research farm under NARC (Nepal Agriculture Research Council) administration since 1987 to 1989 and was brought back under the Department of Livestock Services (DLS) as a production as well as resource farm in 1990. The farm received financial support from GTZ again through PLBP (Promotion of Livestock Breeding Project) from 1990 to 1994 and during this period renovation of sheds and buildings was carried out and some of the farm machineries and animal resources were procured from abroad during this period.

This is the largest farm out of ten government farms under the Department of Livestock Services & different states all over the country. This farm produces buffalo bulls, piglets, day old poultry chicks, Boar goat and forage planting materials and supplies to farmers through Local Governments and Veterinary Hospital and Livestock Services Centers all over the country. Though the command area of the farm was initially supposed to be neighbouring districts and western region, the farm produced genetic resources are supplied to other parts of the country as well. The main activities of the farm are production and distribution of Murrah buffalo bulls, native Kage rams, weaner piglets, day old poultry chicks, Boer Bucks and forage planting materials. In addition to this, the farm has been providing Dairy trainings to the mini dairy plants owner and the aspiring dairy entrepreuners and technical support and services to Pig Breeder Farmers Group of Pokhara in producing high quality weaner piglets being supplied to various districts of Nepal.

1.2 Vision

As Nepal is rich in domestic animal diversity, genetic potentialities of indigenous livestock, in terms of disease resistance and adaptability should be conserved and utilized with or without proper induction of exotic blood to the defined or optimum level. At the same time, low producing, nondescript domestic animals should be upgraded through artificial and natural breeding with exotic breeds-suitable for country's different eco-zones and suitable new breeds of livestock should be developed using native and exotic blood.

As happened in the recent years, productivity of domestic animals and birds will be continuously increased to meet domestic demand and the top priority will be given to milk and meat production in coming years. As slaughtering of cattle is prohibited in the country, cattle have been reared for milk by most of the the modern farms and buffalo has been the choice of animal both for milk and meat production. Therefore, buffalo should also be promoted and propagated in the country. However, as buffalo alone cannot meet the national demand for milk and draft power, upgrading the nondescript & crossbred cattle with exotic breeds to the defined blood level by the breeding policy will continue by means of artificial insemination and other techniques.

1.3 Objectives

Following are the long-term and short-term objectives of NLBO, Pokhara

Long Term Objectives

a) Development of suitable breeds of cattle & buffalo for Hill and Terai belts in collaboration with Animal Breeding Division of Nepal Agriculture Research Council (NARC) and Agriculture and Forestry University.

b) Conservation through utilization of domestic animal genetic resources, such as Yak, Lulu, and Achhamee cattle, Lime and Parkote buffalo, Bhyanglung, Baruwal, Kage, and Lampuchhre sheep, Chyangra, Sinhal and Khari goat, Chwanche and Hurrah Pig, and Ghantikhuile, Naked Neck and Sakini fowl through sustainable group breeding scheme and cryo-preservation through Gene Bank wherever applicable.

c) Increase production and productivity of local and nondescript livestock breeds by supplying superior or quality seed animals and birds as a breeding stock for cross breeding through artificial and natural breeding.

d) Develop and establish organized resource farms in private sector, for improved animal genetic resource supply, especially, through progeny testing program.

e) Substitute import of milk and meat, by increasing domestic production.

f) Formulating the draft of Breeding Policies and Plans for different livestock and poultry.

g) Continuous Selection of Breeding Bulls for semen selection from PPRS- Pedigree Performance Recording Scheme under Dairy Cattle Improvement Program (DCIP) Programs.

Short and Medium-term objectives

a) Complete characterization, identification, selection, conservation and utilization of indigenous animal genetic resources, for better production and productivity.

b) Increase the productivity of cattle and buffalo, through artificial insemination program in road approachable areas, and natural breeding in remote areas.

c) Provide technical guidelines for the establishment of improved animal genetic resource (cattle, buffalo, goat, sheep, pig and poultry) centers in private sector.

d) Select superior sires and dams of cattle and buffalo bulls to be used for frozen semen production.

e) Introduce and practice Embryo Transfer Technology (ETT).

f) Expand AI coverage through intensive AI program and privatization of AI service in potential areas.

g) Introduce & Expand AI services in goat and Pig as well in all the potential districts.

1.4 Location & Soil Type:

This integrated farm with nucleus herds and flock of many livestock species is located at Lampatan, Ward Number 14 of Pokhara Metropolitan City, Kaski district, Gandaki State in Nepal. The farm is situated at an altitude ranging from 640 to 770 meters above sea level and at a distance of 200 km towards west from Kathmandu, nearby Pokhara International Regional Airport and three kilometers towards the south from Amar Singh Chowk, Pokhara. However, the semen production laboratory, breeding bull sheds and liquid nitrogen plant are located at five kilometers towards the south from Amar Singh Chowk.

The top soil layer of the farm land is very thin ranging from 6 to 9 inches with boulder stones in sub-soil layer. The soil is mostly silt loam and poor in organic matter content with PH ranging between 6.3 and 8.0.

2. Policies, Programs, Challenges & Achievements

2.1. Breeding Policy

Presented below is a brief account of livestock & poultry production situation in Nepal as well as the extract of recently passed **National Livestock Breeding Policy 2078.** The major objective, present scenario and the aspects of the livestock & poultry farming in Nepal and the vision & goal of the present livestock breeding policy has been summarized in some points below.

Present situation of Livestock Breed & Breeding

- Farmers are suffering from a very high cost of farm inputs which in turn, is increasing the cost of production of milk, meat, egg etc. every year due to so many technical, political and other reasons.
- Past breed improvement efforts as well as activities for conservation of local animal genetic resources were being conducted on the basis of "Livestock Breeding Policy (2055/56 B.S.)"
- Improvement of local breeds of Cattle and Buffalo is being done mainly by means of crossbreeding (Both by AI, natural mating & very rarely by ET) non descript, crossbred and local breeds with exotic breeds like Jersey, Holstein and Murrah as per their suitability.
- Artificial Insemination program mostly through frozen semen of Jersey, Holstein, Murrah & Boer buck has been continued and seems more effective than other programs for milk and meat production.
- In-Situ & Ex-Situ conservation of certain identified indigenous breeds of local livestock and poultry is also being done in certain locations of some districts with limited efforts.
- Out of total population of livestock, relatively more productive cattle & buffalo population (in terms of daily milk production) is about 13% and 28% respectively. Regarding goat & poultry, roughly 50% of the population is of indigenous breeds and the remaining 50% is more productive in terms of meat and egg production. Similarly, the reliable number of exotic pig population has not been estimated recently. Almost all the country's sheep population is indigeneous.
- Nonetheless, indigeneous breeds have been found more promising for sustainable production of meat, milk, egg, wool and other livestock products despite their low outputs on short term basis. Nepal is rich in livestock and poultry biodiversity. Unfortunately, some of the indigenous breeds are already either extinct or endangered to be extinct. Therefore, the conservation and utilization of ANGR also is equally important.
- Hence there is an extreme need of breed improvement in livestock and poultry either by crosssbreeding or by selection.

Major Problems & Challenges

- Commercialization of livestock and poultry farm industries is still in crawling or snail's pace due to many factors including political as well as non political ones.
- Due to inadequate efforts to conserve ANGR, Siri cow is almost extinct and the population of some other local breeds is continuously decreasing thereby threatening their possible extinction in coming years or decades.
- Due to negligence, there is even import of frozen semen of unnecessary breeds of animals. There is no strong regulatory function of import of such unsuitable semen due to weak implementation of the existing policy.
- Even identified breeds of animals are being bred with other unsuitable breeds which may cause the loss of breed characters or purity of certain animals due to unawareness/negligence of farmers as well as junior level technicians .
- Threats of inbreeding depression is still considered one of the major problems.

Need of National Livestock Breeding Policy 2078

- To implement the Agreements of New Earth Summit 1992 on livestock genetic resource conservation and their improvement.
- To implement Agreement of biodiversity article 6, 1993 in which every country has to develop the policy and strategy of conservation and improvement of indigenous livestock genetic resources.
- To develop and improve suitable/appropriate breeds of livestock, accepted by the Nepalese environment and management of Nepalese farmers and to stop the import of unsuitable/inappropriate and livestock breeds.
- To findout & recommend the appropriate blood level of different breeds of livestock to different eco-zones of Nepal.
- Identification, Conservation and utilization of suitable indigenous livestock breeds for different regions of the country.

National Livestock Breeding Policy 2078 -at a Glance

Vision:

Develop an animal breeding system that maximizes the use, protection and promotion of genetic resource potential in order to be able to transform the livestock sector in an environment-friendly, qualitative, competitive, modern and commercially viable sector of the country.

Goal:

To increase the productivity of milk, fish, meat, pashmina and eggs by protecting, using and developing the genetic potential of different breeds and species of animals.

Major Objectives:

1. Application of appropriate livestock & poultry breeding system for increasing livestock products as well as productivity to address the increasing trend of animal-based products
2. Establishment & regulation of animal genetic resources & breeding centers with in the country to make the country self dependent on such appropriate animal genetic resources
3. Create an ideal environment for conservation & sustainable utilization of indigeneous animal genetic resources & livestock biodiversity.

2.2 Infrastructures/fascilities:

The then NLBC was shifted from Khumaltar, Lalitpur to Lampatan, Pokhara-14, in the year 2058/59 (2001/02). Since then, It has been using approximately 9 hectares (Plot no: 17, 25 and 26) of land owned by the then Livestock Development Farm, Pokhara, and following facilities had been developed by Government of Nepal and ADB funded Third Livestock Development Project financial resources. Purchased Machineries have also been included in the list & some of the infrastrucutes/fascilities have been shared by the nucleus herd & Double Track units of the office as well.

1) Facilities Developed by the resources of Government of Nepal

SN	Item	Detail	Cost of Construction (Rs)
1	Staff Quarter I	Plinth area: 1705 sq. ft. Two floors, 4 families' quarter constructed in 2059.	1800833.00
2	Staff Quarter II	Plinth area: 1705 sq. ft. Two floors, Four families quarter constructed in 2059.	1798115.00
3	Stockman Quarter	Plinth area: sq. ft. Single floor, Four family's quarter constructed in 2058.	1600000.00
4	Feed Store House	Plinth area: 1144.8 sq.ft. Single floor, Five Rooms constructed in 2058.	644000.00

5	Bull Shed II	For twelve bulls with open area: Constructed in 2059.	1495751.00
6	Generator House and Other Facilities	Improvement of collection yard, sheds etc.	1800000.00
7	Bull Exerciser	Providing exercise to bulls for semen collection	149857.70
8	Hay Store	Store Paddy straw for feed as whole year. Constructed in 2064.	400000.00
9	Vehicle Garage	For standing bike and vehicles. Constructed in 2066	4900000.00
10	Bull Shed III	For 12 Bulls with open area: Constructed in 2066.	150000.00
11	Biosecurity gate	To prevent outside animals and diseases	350000.00
12	Biosecurity Post	To prevent zoonotic diseases. Constructed in 2067	150000.00
13	Isolation Shed	To keep diseased animal until cured. Constructed in 2067	150000.00
14	Watchman House	With two rooms, Constructed in 2067	275000.00
15	Office Chief Quarter	Constructed in 2068	4000000.00
16	ET Laboratory	Constructed in 2069 and 2017, 12 rooms	85,00,000.00
17	Bull Shed IV	Constructed in 2069, Capacity 8 bulls	30,00,000.00
18	Buck Shed	Constructed in 2070, Capacity 4 bucks	5,00,000.00
19	Communication Center/Training Hall	Construction Started from 2075/76	1,47,00,000.00
20	Bull Mother Shed	Constructed in the year 2076/77	80,00,000.00
21	New Goat Shed	Constructed in the year 2076/77	70,00,000.00
22	Free Range Poultry Shed and Fence	Constructed in the year 2076/77	30,00,000.00

23	Platform Balance(For the measurement of Bull weight)	Constructed in the year 2076/77	10,00,000.00
24	Building for Feed Mill and Feed Store	Constructed in the year 2076/77	80,11,000.00
25	Baloonhouse for Biogas	Constructed in the year 2076/77	43,70,000.00
26	Pig Shed (New)	Completed in 2077.78	98,50,000.00
27	Goat Shed (New) & Open Shed(New)	Completed in 2077.78	65,00,000.00
28	New Office Building	Completed in 2077.78	70,00,000.00
29	Pig Mating Yard	Completed in 2077.78	5,00,000.00
30	Bull Section's Staff Qtr for Biosecurity	Completed in 2077.78	45,00,000.00
31	Air Shower for lab	Completed in 2077.78	35,00,000.00
32	Dynamic Pass Box	Completed in 2077.78	10,00,000.00
33	Low Presser AV Sterilizer	Completed in 2077.78	10,00,000.00
34	Road Access to Lower Trace	Completed in 2077.78	30,00,000.00
35	Labour Quarter	Completed in 2078.79	45,00,000.00
36	Semen Storage & Management Building	Completed in 2078.79	50,00,000.00
37	Purchase of Nitrogen Transfer Device	Purchased in 2078.79	500,000.00

38	Purchase of Sensing Gun Device for Smile Software	Purchased in 2078.79	1,800,000.00
39	Irrigation Canal (40m)	Completed in 2078.79	40,00,000.00
40	Overhead Tank (100000 litres)	Completed in 2078.79	90,00,000.00
41	Farm Quarantine Shed-i	Completed in 2078.79	30,00,000.00
42	Completed Bull Mother Shed with Store, Compound wall & Recording Room -i	Completed in 2078.79	85,000,000.00
43	Farm Quarantine Shed-ii	Completed in 2079.80	120,00,000.00
44	Completed Bull Mother Shed with Store, Compound wall & Recording Room -ii	Completed in 2079.80	1,50,00,000.00
45	**Biosecurity Residence**	Completed in 2079.80	80,00,000.00
46	**Jyami (Daily based workers) Quarter**	Completed in 2079.80	20,00,000.00
47	**Irrigation Canal (40 meter)**	Completed in 2079.80	40,00,000.00
	Total		**Rs.239,894,557.00**

2) Facilities Developed by TLDP Resources

SN	Item	Detail	Cost of Construction
1	Officer Quarter	Plinth area: 173.864 sq.m. Two floors; Four families' quarter constructed in 2058.	Rs. 3498656.26
2	Bull Shed I	Plinth area: 360.36 sq.m. Good for five Bulls; Constructed in 2059.	Rs. 2129889.90
3	Office cum Semen lab	Plinth area: 297. 30 sq.m. Two Floors; Constructed in 2058 and addition of storey in 2059/60.	Rs. 3526300.26 Rs. 2385000.00
4	Deep Boring & High Tension Line	Completed in 2061/62	Rs. 3518000.00
	Total		Rs. 1,50,57,846.42

3) Facilities Developed by JICA & JICA Senior Volunteer

SN	Item	Detail	Cost
1	Horizontal Autoclave	Company- Yorco India or Other Indian Model- YSU-405 or Other. Size- 400mmx1100mm in diameter and depth (or 500mm x 900mm). Electric load- 9kw. Power supply- 220volt or 440 volts, 3 phase, 50Hz, AC supply	Rs. 590000.00
2	Semen Mother Container/ Refri (5 pieces)	Company- Inox India, Capacity- 47 litre with more than 6 canisters. Canister capacity may be 2 semen goblet, Evaporation rate-0.5 lit./day or less.	Rs. 140000.00
3	Water Bath	Company Yorco India or Other Indian. Model- YSI-413. Size-455 x 300 x 150mm for 6 racks Power supply- 220 volt, single phase, 50Hz, AC supply.	Rs. 68000.00

4	Steri-clean pass box	Company Yorco India or Other Indian Size- 24" x 24" x 24" with double door open single at a time	Rs. 120000.00
5	Multimedia set	Multimedia set having four in one function (Printer, Scanner, Photocopy & fax)	Rs. 100000.00
6	IMV IS-4	Hi- tech semen filling, sealing and printing machine	-
7	Programmable bio-freezer	Hi- tech Programmable bio-freezer	-
8	Laminar Air Flow Cabinet	Hi- tech Laminar Air Flow Cabinet	-
9	Generator-i	25 KVA Capacity	Rs. 700000.00
10	Generator-ii	25 KVA Capacity	Rs. 700000.00
11	Bicycle	-	Rs. 6000.00

4) Facilities Developed by KUBK

SN	Item	Detail	Cost
1	Water Purifier	Siemens Company, Germany	Rs. 6,10,200.00
2	Deep Freeze	RQVD 200 -40^{0}C	Rs. 4,50,870.00
3	Vertical Laminar Air Flow	China	Rs. 4,04,540.00
4	Overhead Water Tank	40,000 litres capacity	4954783.00
5	Collection Yard	Embryo transfer lab	967838.00
6	Compound wall around LN2 plant	Liquid Nitrogen plant	947431.00
7	Laptop, printer	Canon, HP	130001.00
8	Shed for goat	Capacity 60 goats	953627.00
Total			Rs. 94,19,290.00

5) Facilities Developed by the then Directorate of Livestock Production

SN	Item	Detail	Cost
1	Liquid Nitrogen Plant House	Nitrogen Plant Installed	Rs. 45,00,000.00
Total			Rs. 45,00,000.00

6) Land use by the then NLBC

Out of the 9 hectares of land under use, the then NLBC currently has been using as below:

- Building and sheds: 3 ha. (Plot: 26)
- Seasonal Forage Cultivation : 3 ha. (Plot: 25).
- Perennial Forage Cultivation : 3 ha. (Plot: 23).

2.3 Contribution of External Experts/Volunteers

Contribution of JICA experts/ volunteers has been very significant in strengthening NLBC laboratory and AI program. The NLBC laboratory has been benefited from the services of following experts/volunteers.

Mr. Sugiura was the first JOCV to serve this office from July 1985 to July 1988, during his tenure; he demonstrated an excellent ability for the efficient AI in cow. He also worked in the laboratory for production of frozen semen.

Mr. Matsumoto was the Second JOCV to work in the AI program from July 1989 to July 1991. He efficiently worked in the laboratory for processing and storage of frozen semen. He also trained AI technicians for efficient artificial insemination in cattle.

Mr. Shimomura was the third JOCV who worked in this office from April 1992. He along with Mr. Matsumoto, in addition to his main job of collection, processing and storage of semen, managed to construct a trainer's cow shed (18 cow capacity) with the financial help of JOCV/JICA.

Dr. Yoichiro FUJIKA served this office section as a JOCV from 6 April, 1994 to 7 April 1996. During his stay in Nepal, he managed to bring a plastic cow model for training, 38 liquid nitrogen containers, 23 semen refrigerators from JOCV/JICA.

Mr. Nobuhisa YAMANE worked in this Section from July 1998 to June 2000. He worked mainly for improvement of frozen semen.

Mr. Tsutomu ISHIMURA, JICA Expert in animal breeding and reproductive disorder worked from 4th March1999 to March 2001. During his tenure, he was exclusively engaged in correcting reproductive disorders in cattle and buffalo through Moxa cauterization.

Dr. Kyoko KAWAHATA is the first JICA Senior Volunteer in this Center. She is expert in Frozen Semen Production and was worked in this center as Senior Volunteer since 9th February 2009 to December 12, 2010.

The office is thankful to JICA for Senior Expert.

2.4 SOURCE OF GENETIC IMPROVEMENT

1. Frozen Semen Import

Frozen semen from the bulls & Bucks of high genetic merit is the main source of genetic improvement for low producing cattle and buffalo. Up to now 305328 doses of cattle frozen semen have been imported from countries, namely USA, New Zealand, Finland, Germany, Canada, France, Japan, Italy and India (First Table). Similarly, 66690 doses of buffalo frozen semen also have been imported from India (Second Table) in the previous years. The roles of agencies like GTZ, FAO, LIAJ, Second and Third Livestock Development Projects and Embassies have been very significant in strengthening AI program. No frozen semen was imported last year. However, Heifer international Korea had provided some frozen semen to us for breeding the dairy heifers provided to us during last fiscal year.

Detail of Cattle Bull Semen Import

S.N.	DATE	COUNTRY	BREED	SEMEN DOSE	SOURCE
Jersey					
1	12/17/1985	Australia	Jersey	6000	-
2	2/22/1988	Canada	Jersey	1000	-
3	12/12/1989	Denmark	Jersey	3000	FAO
4	6/5/1991	New Zealand	Jersey	5000	GTZ
5	10/24/1991	USA	Jersey	15000	SLDP

S.N.	DATE	COUNTRY	BREED	SEMEN DOSE	SOURCE
6	11/16/1991	-	Jersey	15000	SLDP
7	11/10/1992	New Zealand	Jersey	7000	GTZ
8	10/22/1992	New Zealand	Jersey	10000	GTZ
9	11/1/1999	India	Jersey	12510	ABAI
10	10/4/2000	India	Jersey	15000	TLDP
11	4/14/2000	India	Jersey	5007	TLDP
12	5/5/2000	India	Jersey	1000	TLDP
13	7/13/2001	India	Jersey	7000	ABAI
14	2003 April	India	Jersey	30000	ABAI
15	2005 July	India	Jersey	28350	TLDP
16	2007 January	New Zealand	Jersey	5000	DCIP
17	2009 January	India	Jersey	5000	Chitawon Milk
18	2011 July	USA	Jersey	2500	DCIP
19	2012 Iun	USA	Jersey	2500	USAID
20	2012 Jun	USA	Sex Semen	2300	Practical Action
21	2013 Jun	USA	Sex Semen	150	US Embassy
22	2015 Sept	USA	Jersey	6000	KUBK
23	Jul-17	USA	Jersey	3000	KUBK
24	2018/2019	USA	Jersey	4025	NLBO

S.N.	DATE	COUNTRY	BREED	SEMEN DOSE	SOURCE
25	2019/2020	Canada	Jersey	4000	NLBO
26	2020/21	Canada	Jersey	5500	NLBO
Total				200,842	
Brown Swiss					
26	11/15/1985	Switzerland	*B. Swiss*	2000	-
27	2/14/1986	Switzerland	*B. Swiss*	2000	-
28	5/18/1988	Germany	*B. Swiss*	10786	-
29	10/14/1991	USA	*B. Swiss*	1000	SLDP
30	11/16/1991	-	*B. Swiss*	1000	SLDP
31	5/2/1994	USA	*B. Swiss*	5000	SLDP
Total				21786	
Holstein & Holstein Freisan					
32	12/16/1985	Finland	HF	5000	-
33	10/29/1987	USA	HF	4000	-
34	2/18/1988	Canada	HF	2000	-
35	6/5/1991	New Zealand	HF	5000	GTZ
36	10/24/1991	USA	HF	8000	SLDP
37	11/16/1991	-	HF	8000	SLDP
38	3/3/1992	France	HF	340	French IMV
39	1992/11/10	New Zealand	HF	3000	GTZ

S.N.	DATE	COUNTRY	BREED	SEMEN DOSE	SOURCE
40	3/25/1997	Japan	HF	5000	LIAJ
41	12/22/1998	Japan	HF	4000	LIAJ
42	2009/Jan	New Zealand	HF	5000	DCIP
43	2010 Jan	India	HF	5000	Chitawan Milk
44	2011 July	USA	HF	2500	DCIP
45	2012 Jun	USA	HF	2500	USAID
46	2012 Jun	USA	Sexed Semen	2300	Praction Action
47	2013 Jun	USA	Sexed semen	150	US Embassy
48	2018/19	USA	HF	3410	NLBO
49	2019/20	USA	Holstein	2500	NLBO
50	2020/21	USA	Holstein	5000	NLBO
Total				72700	
Ayrshire					
50	12/16/1985	Finland	Ayrshire	1000	-
52	2/22/1988	Canada	Ayrshire	1000	-
Total				2000	
Others					
53	3/3/1992	France	Tarentaise	1380	French IMV

S.N.	DATE	COUNTRY	BREED	SEMEN DOSE	SOURCE
Total				1380	
54	7/15/2008	India	Hariana	5000	Government
Total				5000	
Sexed Semen					
55	2015	USA	Holstein Freisan	4000	NDDB
56	2015	USA	Jersey	4000	NDDB
57	2015	USA	Jersey	1000	KUBK
Total				9000	
Boer Buck					
58	2015	USA	Boer	3000	KUBK
59	2017	USA	Boer	1500	KUBK
Total				**4500**	

Details of Murrah Buffalo Bull Semen Import

SN	DATE	COUNTRY	BREED	SEMEN DOSE	SOURCE
1	11/19/1991	India	Murrah	16000	SLDP
2	10/23/1992	India	Murrah	5000	GTZ
3	7/7/1993	India	Murrah	16000	SLDP
4	11/1/1999	India	Murrah	7440	NLBC

5	1/5/2000	India	Murrah	4950	TLDP
6	2005 June	India	Murrah	3900	TLDP
7	2010 Jan	India	Murrah	5000	Chitawan Milk
8	2012 Jan	India	Murrah	8400	BGIP/USAID
9	Jul-2017	India	Murrah	3000	KUBK
Total of Murrah semen import till the end of FY 2079/80				69690	
Total of Cattle Bull, Murrah Bull and Buck semen import till the end of FY 2079/80 (2022/2023)				**385518**	

2. Frozen Semen Production

NLBO, Pokhara imports only a small fraction of frozen semen that it distributes. The major portion of the frozen semen isproduced in its laboratory. Table below shows semen production in NLBO Lab during 2079/80 (2022/23).

2.1) Bull & Species wise Frozen Semen Production in 2079/80 by NLBO, Pokhara

2.1.1) Bull wise Frozen Semen Production in 2079/80 by NLBO, Pokhara

PJ 67	PJ 71	PJ 73	PJ 75	PJ 76	PJ 78	PJ 79	PJ 80	PJ 81	PJ 82	PJ 83	PJ 84	PJ 85	PJ 86	PJ 87	ET 6	HF 28	HF 30	HF 31	HF 32	HF 33	HF 34	HF 35	HF 36	HF 37	HF 38	HF 39	HF 40	ET 7	PM 69	PM 101	PM 102	PM 103	PM 106	PM 107	PM 108	PM 109	PM 110	PM 111	PM 112	PM 113	PM 114	PM 115	Goat	Total
1110	26910	27783	14482	26830	3640	26438	36199	16160	28555	17040	11945	7810	10160	5825	10300	20335	14985	15970	17625	21340	12820	17280	14910	10155	1100	2195	3045	27460	13870	6310	14590	15547	10830	12765	14285	16415	9760	11003	9690	5110	640	9290	12488	613000

2.1.2) Buckwise Semen Production at NLBO, Pokhara in 2079/80

BAT	DATE	PG 005	PG 06	PG 09	PG 10	PG 12	PG 13	PG 15	PG 16	Total
1	2079\04\02	0	35	5	70	210	65	120		505
2	2079\04\05	0	30	25	100	65	35	0		255
3	2079\04\09	155	80	150	260	85	0	0		730

4	2079\04\12	0	0	0	0	0	0	0	0	0
5	2079\04\17	0	0	0	0	0	0	0	0	0
6	2079\04\20	75	35	65	95	115	0	105		490
7	2079\04\23	135	40	100	160	130	55	55		675
8	2079\04\26	0	125	45	55	180	50			455
9	2079\04\30	0	110	120	195	75	30	200		730
10	2079\05\02	0	0	0	0	0	0	0	0	0
11	2079\05\06	0	0	0	0	0	0	0	0	0
12	2079\05\09		0	0	0	0	0	0	0	0
13	2079\05\13	0	60	130	130	40	40	110	30	540
14	2079\05\16	0	0	0	0	0	0	0	0	0
15	2079\05\20	70	50	60	130	160	55	90	0	615
16	2079\05\24	0	30	45	35	30	30	60	0	230
17	2079\05\27	110	60	100	75	100	40	130		615
18	2079\05\30	0	25	40	75	70	35	35	0	280
19	2079\06\03	160	110	70	170	55	55	185		805
20	2079\06\06	20	40	45	90	80	15	75		365
21	2079\06\10	0	0	0	0	0	0	0	0	0
22	2079\06\13	50	75	110	135	140	35	105		650
23	2079\06\24	0	60	60	135	115	30	70		470
24	2079\06\27	178	60	90	110	65	40	110		653
25	2079\06\31	0	60	65	140	80	0	150		495
26	2079\07\03	95	35	25	25	80	50	50		360
27	2079\07\15	0	0	0	0	0	0	0		0
28	2079\07\18	0	0	0	0	0	0	0		0
29	2079\07\22	0	105	70	110	75	65	0		425
30	2079\07\25	0	0	0	0	0	0	0		0
31	2079\07\28	0	0	0	0	0	0	0	0	0
32	2079\08\01	160	60	40	80	0	35	0	0	375
33	2079\08\06	0	0	0	0	0	0	0	0	0
34	2079\08\09	0	0	0	0	0	0	0	0	0
35	2079\08\12	0	0	0	0	0	0	0	0	0
36	2079\08\16	0	0	0	0	0	0	0	0	0
37	2079\08\19	0	0	0	0	0	0	0	0	0
38	2079\08\22	0	0	0	0	0	0	0	0	0
39	2079\08\26	0	0	55	0	0	0	0	0	55
40	2079\08\29	0	0	90	160	65	105	125	0	545
41	2079\09\04	0	0	15	70	35	75	85	0	280
42	2079\09\07	0	0	25	55	0	50	85	0	215
43	2079\09\011	0	0	0	0	0	0	0	0	0
44	2079\09\14	0	0	90	85	105	55	0	0	335
45	2079\09\18	0	0	20	145	90	85	0	0	340
Total		**1208**	**1285**	**1755**	**2890**	**2245**	**1130**	**1945**	**30**	**12488**

2.1.3) Species wise Frozen Semen Production in 2079/80 by NLBO, Pokhara

Bull Name	Jersey	Holstein	Murrah	Boer Buck	Grand Total
Semen Produced	271187	179220	150105	12488	613000

3. Frozen Semen Quality

In continuous attempt to improve quality of frozen semen, NLBO in the past has brought about many changes in laboratory practices and will continue to improve further in future also. Following are the major changes introduced in the laboratory with an aim of improving the semen quality.

3.1) Bull Rearing:

- Screening of bulls against diseases (Brucellosis, TB, Leptospirosis, Campylobacter etc).
- Maintaining health and hygiene of the bulls.
- Regular drenching of bulls against external and internal parasites.
- Regular exercise of the bulls for the fitness in Bull Exerciser.

3.2) Semen Collection

- Use of bull apron to prevent contamination.
- Collecting semen from a bull twice a week and only two ejaculations with an interval of minimum thirty minutes on the day of semen collection.
- Maintaining hygiene at collection yard.

3.3) Extender

- Use of double distilled rain water instead of single distilled tap water.
- Use of water purifier to sterilize rain water.
- Use of readymade non animal origin soyabased semen extender (made in Germany & France) since 2012/13 alongwith egg-yolk base extender.
- Change of buffer from tri-sodium citrate to tris in manual process.
- Addition of egg-yolk and antibiotics in the morning of collection day instead of evening in manual process.

3.4) Semen Evaluation

- Regular use of latest spectrophotometer of Minitube (for Buck semen anaysis) and IMV Company (for Bull semen anaysis) to determine sperm concentration.

- Reduction of sperms per dose of semen from 40000000 to 20000000 (total sperm count with more than 70% Motile sperm before processing) in 0.25 ml straw capacity because of improved quality of sperm.
- Evaluation of semen from the initial dilution stage to the time of dispatch.

3.5) Semen Processing

- Single step extension instead of phased extension.
- Use of masks, gloves etc and increased laboratory sanitation.
- Filling, Sealing and Printing of semen straws by IS-4(IMV Company, France), and Quattro automatic filling, sealing & printing mechine (Minitube Company, Germany) which is a great change for this lab.
- Use of SMILE Software to reduce data recording error and to set intregrated laboratory environment & use of CASA system for semen evaluation which is also a milestone for the upgrading of the lab.
- Processing method of buck semen has also been upgraded to remove the phospholipase enzyme from the semen through centrifugation method for the better quality semen for higher conception rate.

3.6) Quality Control

- Checking post thaw semen motility 48 hrs after freezing before storage.
- Periodic checking of post thaw viability.
- Checking of bacterial load in laboratory and semen.
- Periodic Hypo-osmotic Swelling test to check sperm cell integrity.
- Periodic Live-dead count of frozen semen.
- Acrosomal Integrity Test.
- Fumigation of Lab from Auto fumigator.

3.7) Storage

- Use of separate mother referees for storing individual bull semen.
- Counting of semen straws in LN_2 while transferring.

3.8) Distribution

- Counting semen straw in LN_2 during distribution.
- Allotment and rotation of bulls for different regions according to distribution plan to prevent inbreeding.

3.9) Renovation of Lab Structures for Biosecurity and standardisation as well as ISO accreditation process has begun from the fiscal year 2075.76.

3.9) Summary of semen quality control: 2079/80 (2022/23)

Presented in the table below is summary of quality control tests conducted at NLBO lab in the year 2079/80

Summary of semen quality control-2079/80

S.N.	Test	Standard	At NLBO		
			Lowest	Best	Average
1	Microbial Load in-				
	Laboratory air (Different locations)	Maximum 10 colonies	50	6	
	Working solution	0	0	0	0
	Pooled Frozen Semen	0	0	0	0
2	Post-thaw Motility	40 %	45 %	60 %	48%
3	Post-thaw Viability of Semen	10 % after 3rd hour	10 % after 2nd hour	30 % after 3rd hour	
4	Hypo-osmotic Swelling	60-70 % +ve	55 % +ve	65 + ve	60.59%
5	Live Sperms %		45 %	70 %	55%
6	Abnormal Sperms	Up to 20 %	19.59 %	3.56%	11.57%
7	Sperm Concentration/dose (million)	15-30	18.40	22.51	20.45

Semen Quality Parameters of Jersey Bulls of NLBO, Pokhara -2079/80

S. N.	Bull Number	Post Thaw Motility %	Post Thaw Viability 1 hr (%)	Post Thaw Viability 2 hr (%)	Post Thaw Viability 3 hr (%)	HOS Responsive Cells (%)	Sperm concentration per ml ($x10^9$)
1	PJ 67	49.38	33.44	21.88	11.56	63.63	1.15
2	PJ 68	48.75	32.81	18.44	10.47	64.38	.887
3	PJ 69	48.28	32.5	20.31	10.47	63.53	1.52
Average		48.80	32.91	20.21	10.83	63.84	1.18

All these practices have helped improve semen quality and made the laboratory able to produce and distribute quality semen with a minimum of 45% motility and 20000000 sperms per dose helping improve conception rate.

4) Trend of Semen & Liquid Nitrogen Production, Distribution & AI

4.1) Semen Production Trends

Following table shows the species wise semen production in the year 2079/80 from all the three NLBOs.

S.N.	Species/Breed	Semen produced(dose)
1	Cattle/Holstein	330824
2	Cattle/Shahiwal, Hariyana, Gir	34734
3	Cattle/Jersey	359979
4	Buffalo/Murrah	225055
5	Goat/Boer	15720
6	**Total**	**966312**
	Overall Growth	20.60%

4.2) Trend of Semen Production, Liquid nitrogen production, Distribution & AI

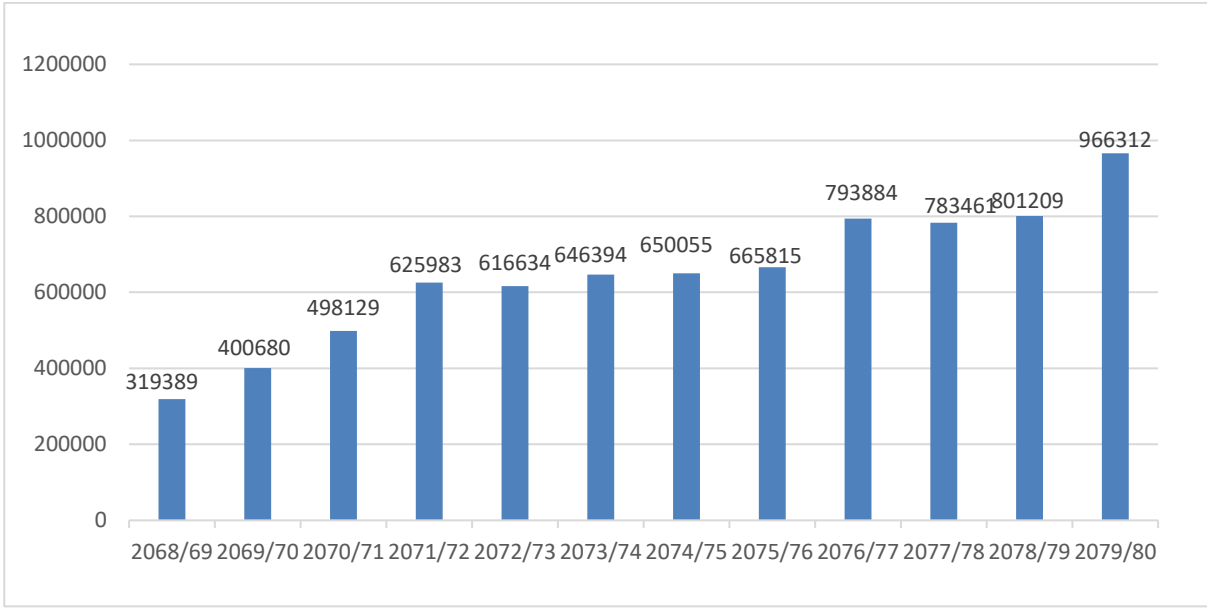
Following table compiles the production & distribution of semen & liquid nitrogen in relation to AI from the year 2050/51 to the year 2079/80 & the growth trend as well.

NFY	Semen Production	Increment	Semen Distribution	Increment	LN_2 Distribution/ Consumption	Increment	AI Progress	Growth	LN_2/AI	Semen/AI	AI/Lit LN2
2050/51	15115	-	22448	-	23431	-	18815	-	1.25	1.19	0.80
2051/52	13705	-9.33	29007	29.22	25917	10.61	17552	-6.71	1.48	1.65	0.68
2052/53	22797	66.34	32702	12.74	23124	-10.78	22906	30.50	1.01	1.43	0.99

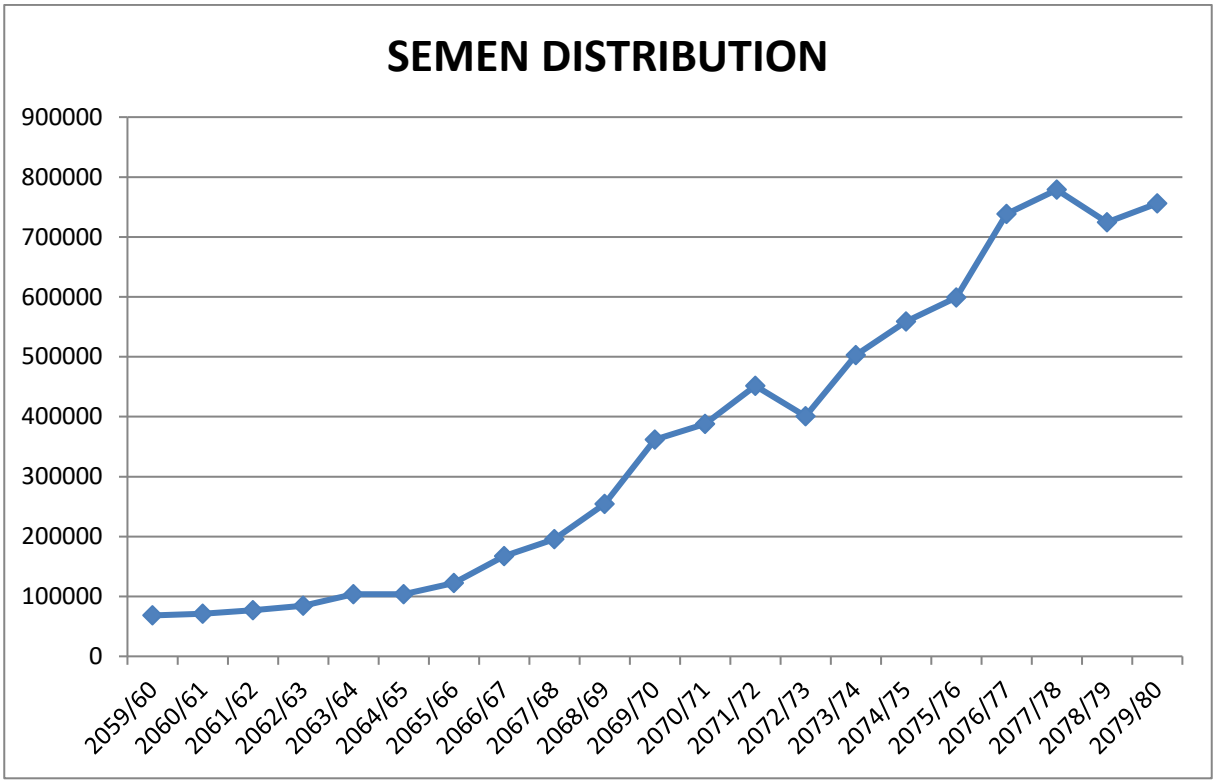
2053/54	18329	-19.60	35083	7.28	33768	46.03	25865	12.92	1.31	1.36	0.77
2054/55	27586	50.50	47935	36.63	43107	27.66	32817	26.88	1.31	1.46	0.76
2055/56	27297	-1.05	50856	6.09	28802	-33.18	32637	-0.55	0.88	1.56	1.13
2056/57	18480	-32.30	40332	-20.69	28239	-1.95	35248	8.00	0.80	1.14	1.25
2057/58	24373	31.89	49675	23.17	37908	34.24	41165	16.79	0.92	1.21	1.09
2058/59	32298	32.52	64122	29.08	48601	28.21	56439	37.10	0.86	1.14	1.16
2059/60	52174	61.54	68311	6.53	56186	15.61	57683	2.20	0.97	1.18	1.03
2060/61	65460	25.46	71273	4.34	54088	-3.73	60206	4.37	0.90	1.18	1.11
2061/62	70051	7.01	76937	7.95	54749	1.22	65440	8.69	0.84	1.18	1.20
2062/63	101182	44.44	84564	9.91	54812	0.12	73676	12.59	0.74	1.15	1.34
2063/64	117687	16.31	103875	22.84	54907	0.17	87441	18.68	0.63	1.19	1.59
2064/65	122932	4.46	103766	-0.10	51541	-6.13	86649	-0.91	0.59	1.20	1.68
2065/66	139063	13.12	122483	18.04	57059	10.71	98265	13.41	0.58	1.25	1.72
2066/67	161322	16.01	167233	36.54	75808	32.86	149261	51.90	0.51	1.12	1.97
2067/68	250460	55.25	195501	16.90	79717	5.16	195501	30.98	0.41	1.00	2.45
2068/69	319389	27.52	254481	30.17	99908	25.33	260166	33.08	0.38	0.98	2.60
2069/70	400680	25.45	361711	42.14	106008	6.11	374329	43.88	0.28	0.97	3.53
2070/71	498129	24.32	387644	7.17	152407	43.77	445254	18.95	0.34	0.87	2.92
2071/72	625983	25.67	451312	16.42	170852	12.10	487886	9.57	0.35	0.93	2.86
2072/73	616634	-1.49	400964	-11.16	120293	-29.59	493133	1.08	0.24	0.81	4.10
2073/74	646394	4.83	502719	25.38	173558	44.28	574641	16.53	0.30	0.87	3.31

2074/75	650055	0.57	559126	11.22	110721	-36.21	571771	-0.50	0.19	0.98	5.16
2075/76	665815	2.42	599036	7.14	190336	71.91	622619	8.89	0.31	0.96	3.27
2076/77	793884	19.23	738564	23.29	225909	18.69	577719	-7.21	0.391	1.28	2.56
2077/78	783461	-1.31	778721	5.44	275507	21.95	701433	21.41	0.393	1.11	2.55
2078/79	801209	2.27	724610	-6.95	313470	13.78	718653	2.45	0.44	1.01	2.29
2079/80	966312	20.61	755971	4.33	345628	10.26	718476	-0.02	0.48	1.052	2.079

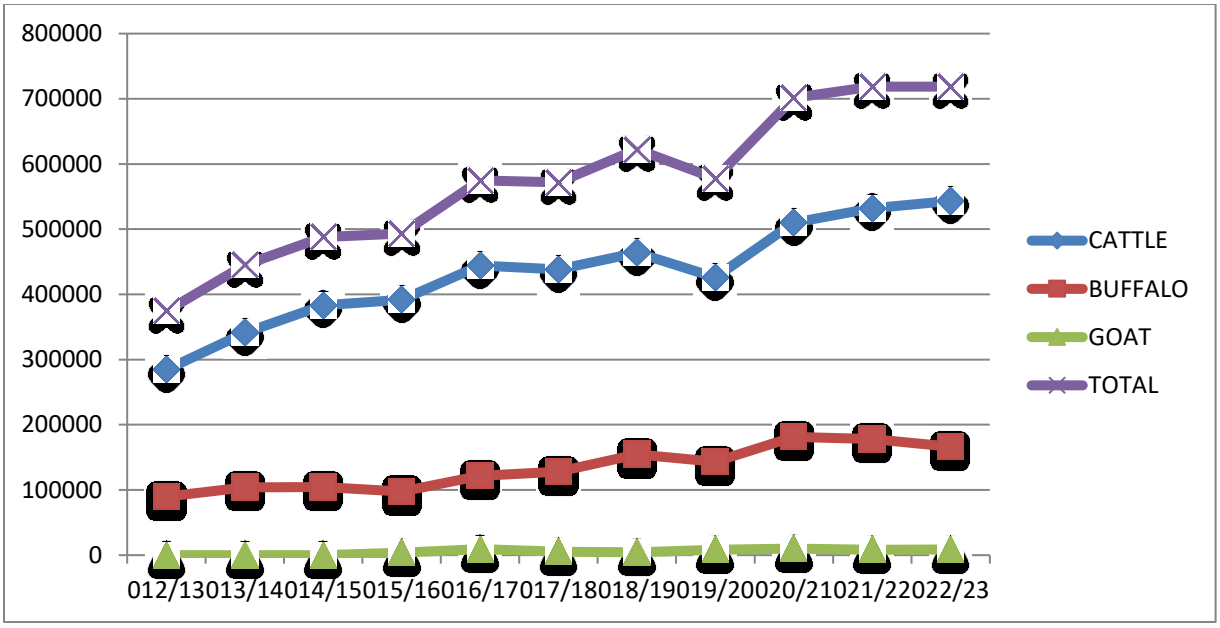
Trend of Semen Prodution in the Last Decade (Semen Production in Doses)



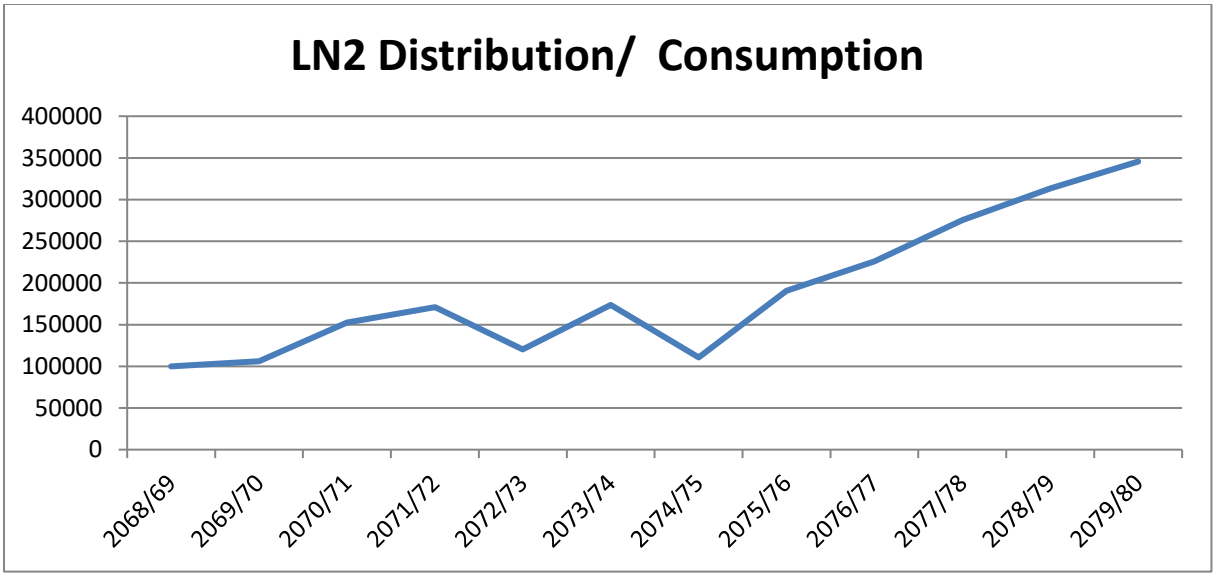
Trend of Semen Distribution (Semen Distribution in Doses)



Trend of Artificial Insemination in the Last Decade (AI in number)



Trend of Liquid Nitrogen Distribution/Consumption in the Last Decade
(Liquid Nitrogen Distribution in litres)



4.3) Cost of Semen Production: 2079/80 (2022/23)

Production cost per dose of straw on the basis of all the direct costs in the year 2079/80 (2022/23) is estimated to be Rs. 28.86. This cost does not include depreciation and or salary of the staff involved and is calculated according to the Table below.

Cost of Semen Production- 2079/80

SN	Expenses	Amount (Rs)	% of total cost
1	Laboratory operation (Chemicals, Glass wares, AV, Liner, Servicing, LN2, Electricity etc)	7715637	43.61
2	Bull management Cost all with Test and others	7888706	44.58
3	Semen Straw Cost (748000 straws in Rs. 2.49)	1862520	10.53
4	LN2 Cost (Included in laboratory operation) 3750 lit*60.5/lit	226875	1.28
	Total cost excluding fixed costs and staff salary	**17693738**	**100.0**

	Total no of semen doses produced	**613000**	
	Production cost/dose	**28.86**	

4.4) Import of Embryo in the Fiscal Year: 2079/80

S.N.	Breed	No. of Embryo imported	Country
1	Jersey	0	
2	Holstein	0	
3	Others	0	
	Total	**0**	

5) Pedigree of Bulls

The pedigree record of different bulls at NLBO, Pokhara is presented in Table below. As the records show, except ET born bulls & bulls imported from the USA & South Korea, the bulls are either imported from India or selected locally. During the fiscal year 2078.79 & 2079.80, NLBO, Pokhara has been enriched by the quality bulls from the USA (by NLSIP Project) & South Korea (By Heifer International) respectively. These bulls will definitely be recorded as the historic achievement for the whole country's breed improvement account & we will always be thankful to the donors for the same. Since, NLBO, Pokhara has already initiated Progeny Testing and Pedigree Performance Recording Scheme; some bulls were selected on the basis of breeding value and purchased from the farmers as per the PPRS program's norms.

Jersey Bull with Pedigree Record as of 2080/03/31 (Closing Stock)

SN	***Bull No.***	***Bull Name***	***Birth date***	***Received date***	***Sire No.***	***Sire's dam's milk productio / Lact (Kg)***	***Dam ID***	***Dam's milk production/Lactation (Kg)***	***Source***
1	PJ - 51	Guru	2063 /02/3 1	1/10/ 2064	PJ 925	4000	Jersey	3500	NLBC Selection (Lalitpur)
2	PJ - 55	Hari	10/1 2/20 64	11/2 3/20 66	PJ-46	6000	Jersey	4200	NLBC Selection (Rupendehi)

SN	*Bull No.*	*Bull Name*	*Birth date*	*Received date*	*Sire No.*	*Sire's dam's milk productio / Lact (Kg)*	*Dam ID*	*Dam's milk productio n/Lactati on (Kg)*	*Source*
3	PJ-56	Delhi	8/22/2066	12/29/2067	PJET2	7500	4044	3141.75	DCIP Selection (Rupendehi)
4	PJ-57	Nandi	10/23/2066	12/29/2067	103085 NZ	8000	4185	3071.65	DCIP Selection (Rupendehi)
5	PJ-58	Gumba	8/28/2067	12/28/2067	PJET2	7500	2622	3240.7	Giri farm, Dholakha
6	PJ-66	Sitaram	10/25/2067	11/29/2068	304126 NZ	7500	3060	5290.2	DCIP Selection
7	PJ 67	Sawarmati	12/15/2069	2/13/2071	7JE 7859US	8500	3156	4506.45	DCIP Selection (Gorkha)
8	PJ 68	Lake	5/15/2068	2/13/2071	7JE 7859US	8500	3144	3721.1	DCIP Selection (Gorkha)
9	PJ 69	Gorkha	12/15/2069	2/13/2071	7JE 7859US	8500	3118	3999.15	DCIP Selection (Gorkha)
10	PJ 70	John	4/16/2070	2/13/2071	7JE 7859US	8500	3165	5726.1	DCIP Selection (Gorkha)
11	PJ 71	Kapoor	4/13/2070	2/26/2071	305054 USA	8000	2642	3369.75	Giri farm, Dholakha
12	PJ 73	Nare	7/3/2071	3/28/2072	7JE859 USA	8500	11107	4692	DCIP Selection (Gorkha)
13	PJ 75	Nakul	12/2/2071	3/28/2072	7JE859 USA	8500	2621	4377.2	Giri farm, Dholakha
14	ET 6	Apar	1/6/2074	1/28/2075	14DTE 835	9000	1680 Surrogate	10000	NARC ET
15	PJ 76	Harka	10/6/2073	1/28/2075	305054 CFp181	7500	1832	4200	DCIP Chitwan
16	PJ 78	Avimat	11/23/2074	9/20/2075	Sex Semen	10000	NA	4000	Argakhachi
17	PJ-79	Pralahd	4/10/2076	8/16/2077	VJ Link 303327	7043	C 0935	4500	DCIP Selection (Kabhrepalanchok)

SN	*Bull No.*	*Bull Name*	*Birth date*	*Received date*	*Sire No.*	*Sire's dam's milk productio / Lact (Kg)*	*Dam ID*	*Dam's milk productio n/Lactati on (Kg)*	*Source*
18	PJ-80	Damu	6/22/2076	8/16/2077	Sex semen	7500	2190	4500	DCIP Selection Jiri farm, Dholakha
19	PJ-81	JIRE	5/25/2076	8/16/2077	Sex semen	7500	22234	4000	DCIP Selection Jiri farm, Dholakha
20	PJ-82	PRADIP	7/17/2077	8/17/2077	305054 USA	8000	22320	4100	DCIP Selection Chitwan
21	PJ-83	GALLANT-ET	3/5/2021	3/1/2022	551JE1762	9749	12092	9605	ST genetics, USA
22	PJ-84	CALLIBAN	12/5/2020	3/1/2022	7JE1787	9471	10928	9420	ST genetics, USA
23	PJ-85	RAMJEE	5/18/2078	10/28/2078	7JE920	7050	25069/550	4700	PPRS Selection, Laligurans Dairy Farm, Chitwan
24	PJ-86	DEVI	12/21/2077	12/20/2078	ET-06	10000	DK1326	4800	PPRS Selection, Kavre
25	PJ-87	KHUMAL	3/2/2078	6/10/2078	ET-06	10000	5587	4800	PPRS, NARC, Khumaltar
26	PJ-90	NA	3/18/2078	10/28/2078	7JE1477	8675	368	4550	PPRS Selection, Laligurans Dairy Farm, Chitwan
27	PJ-91	NA	5/18/2078	10/28/2078	7JE1477	8675	25174/865	4400	PPRS Selection, Laligurans Dairy Farm, Chitwan
28	PJ-92	NA	11/4/2076	11/7/2078	7JE920	7050	22622	4000	PPRS Selection Jiri Farm,Dholakha
29	PJ-93	NA	11/5/2076	11/7/2078	7JE920	7050	2843	3100	PPRS Selection Kabre
30	PJ-94	NA	2/2/2078	11/7/2078	7JE1477	8675	22215	3800	PPRS Selection Jiri Farm,Dholakha

SN	Bull No.	Bull Name	Birth date	Received date	Sire No.	Sire's dam's milk productio / Lact (Kg)	Dam ID	Dam's milk productio n/Lactati on (Kg)	Source
31	PJ-95	NA	11/25/2020	3/1/2022	200JE1162	9636	11233	9945	ST genetics, USA
32	PJ-86	FRANK	5/20/2021	3/1/2022	97JE202	9229	309	9195	ST genetics, USA
33	NA	NA	7/25/2022	12/22/2022	020067276204	NA	501184888	8050	South Korea

Holstein Bulls with Pedigree Records at NLBO, Pokhara as of 2080/03/31 (Closing Stock)

S. N.	Bull No.	Bull Name	Birth date	Received date	Sire No.	Sire's dam's milk productio/ Lact	Dam ID	Dam's milk production/ Lactation	Source
1	PHF-10	Sunrise	9/16/2062	11/22/2066	HF Bull	8000	NA	6500	NLBC Selection (Rupandehi)
2	PHF-11	Rajesh	7/24/2065	11/22/2066	HF Bull	8000	NA	6100	NLBC Selection (Rupendehi)
3	PHF-12	Dipen	5/14/2065	11/22/2066	PJE-3	8000	NA	6500	NLBC Selection (Rupendehi)
4	PHF-13	Narayan	9/10/2064	11/22/2066	HF Bull	8000	NA	6000	NLBC Selection (Chitwan)
5	PHF-14	Janak	6/25/2066	12/29/2067	FB884 NZ	8000	4026	5717.85	NLBC Selection (Rupendehi)
6	PHF-16	Raju	2/8/2067	10/19/2067	100090 NZ	8000	3169	3057.2	DCIP Selection Gorkha
7	PHF-17	Krishna	10/27/2066	11/4/2067	100098 NZ	8000	6602	4500	DCIP Selection (Dharan)
8	PHF-18	Raj	2/5/2067	7/4/2067	102017 NZ	8000	3008	3971.85	DCIP Selection (Pokhara)
9	PHF-20	Purna	2/10/2067	12/30/2067	100093 NZ	9500	3897	5369.85	DCIP Selection (Chitwan)
10	PHF-22	Shiva	8/27/2067	11/29/2068	HF104212NZ	10000	2775	6750.2	DCIP Selection (Panta Farm)
11	PHF-23	Amit	7/20/2068	2/13/2071	HF101169NZ	8500	4062	3879.3	DCIP Selection (Rupandehi)
12	PHF-24	Pandey	4/25/2070	2/13/2071	7H010862USA	9000	4062	3879.3	DCIP Selection (Rupandehi)

S. N.	Bull No.	Bull Name	Birth date	Received date	Sire No.	Sire's dam's milk production/ Lactation	Dam ID	Dam's milk production/ Lactation	Source
13	PHF-25	Puspa	1/11/2069	9/25/2070	7H010533USA	9000	10212	5973.4	DCIP Selection (Pokhara)
14	PHF-26	Subash	5/5/2067	12/29/2067	302031NZ	8500	4225	4578	DCIP Selection (Gorkha)
15	PHF-27	Suman	1/2/2074	1/30/2075	HOC8956379USA	9000	NA	5050	DCIP Selection (Gorkha)
16	ET 7	Dollar	2/7/2074	1/29/2075	HOC8956379	10000	CHORUS	11000	Gorkha, Born from ET
17	PHF-28	RAJEEV	10/1/2074	8/3/2077	14HO7660	7000	3060	5430	DCIP Selection (Gorkha)
18	PHF-30	GERRARD	2/6/2076	8/16/2077	00200HO0185	9000	26025	6050	DCIP Selection (Chitwan)
19	PHF-31	MAHESH	6/27/2076	3/15/2078	7HO13279	10660	13655	4800	DCIP Selection (Gorkha)
20	PHF-32	MAHADEV	5/10/2076	3/15/2078	HO7090	10885	9645	4620	PPRS Selection (Gorkha)
21	PHF-33	MAGEL-ET	12/14/2020	3/1/2022	7HO15197	13150	HO840003204071939	13065	ST genetics, USA
22	PHF-34	BHOJ	8/19/2077	3/11/2078	ABS,Brute 28HO18391	11353	23270	4700	PPRS Selection (Rupandehi)
23	PHF-35	RAJAN	11/5/2077	6/10/2078	14HO7770	9000	23455	5500	PPRS Selection, NARC Khumaltar
24	PHF-36	PRAKASH	2/16/2078	10/17/2078	14HO7660	7000	2507	4600	NLBO, Pokhara
25	PHF-37	ABHI	11/21/2077	10/28/2078	14HO7593	9531	12596	5370	PPRS Selection, NARC, Rampur
26	PHF-38	SHERU	3/20/2078	12/18/2078	14HO7660	7000	25140/352	5185	NLBO, Pokhara
27	PHF-39	DHAKA	4/10/2076	11/1/2078	14HO7760	8743	13297	4870	PPRS Selection, Yampaphat
28	PHF-40	SUJU	3/26/2078	12/18/2078	14HO7600	7000	2510	4600	NLBO, Pokhara
29	ET-08	NA	079-01-20	12/7/2079	ES07HO71440464 Bugle	10530	HO30069728161H1131 4 MOGUL	12557	Laliguras Farm, Chitwan
30	ET-09	NA	079-06-20	12/7/2079	HO3128463273 Superhero	10850	HO3128615555 Paprika	13220	Laliguras Farm, Chitwan
31	PHF	NA	9/15/2077	3/11/2078	250HO13449, USA	12104	23324	5110	PPRS, Rupandehi, Yagyamurti
32	PHF	NA	1/5/2079	10/8/2079	14HO07724	12720	78869	5000	PPRS,Lamjung
33	PHF	NA	8/3/2022	12/22/2022	020071703339	NA	501279409	9344	South Korea
34	PHF	NA	8/9/2022	12/22/2022	023123886035	NA	500928608	0	South Korea
35	PHF	NA	7/31/2022	12/22/2022	023150607206	NA	501242813	13973	South Korea

S. N.	*Bull No.*	*Bull Name*	*Birth date*	*Received date*	*Sire No.*	*Sire's dam's milk production/ Lactation*	*Dam ID*	*Dam's milk production/ Lactation*	*Source*
36	PHF	NA	8/17/2022	12/22/2022	023149432290	NA	501334516	11664	South Korea
37	PHF	NA	9/11/2022	12/22/2022	023140503758	NA	501337846	6751	South Korea

Murrah Bulls with Pedigree Records at NLBO, Pokhara as of 2080/03/31 (Closing Stock)

S. N	***Bull No.***	***Bull Name***	***Birth Date***	***Received date***	***Sire No.***	***Sire's dam's milk producti o/ Lactatio n***	***Dam ID***	***Dam's milk productio n/ Lactation***	***Source***
1	PM-46	Yam	2/2/2065	5/2/2065	NA	NA	NA	3200	Local Selection, Lahan
2	PM-47	Dilip	2065/02/ 30	5/20/206 5	NA	NA	NA	3000	Local Selection, Lahan
3	PM-54	Kiran	1/25/200 9	3/28/206 9	NA	NA	RPP/61 8	3653	Imported from Hariyana, India
4	PM 53	Badal	8/4/2009	3/28/206 9	NA	NA	RRP/72 9	3762	Imported from Hariyana, India
5	PM-55	Laldhoj	1/7/2009	3/28/206 9	NA	NA	RRP/72 7	3711	Imported from Hariyana, India
6	PM-56	Chanda	6/10/200 9	3/28/206 9	NA	NA	RRP/72 8	3794	Imported from Hariyana, India
7	PM-57	Badri	2/10/200 9	3/28/206 9	H-45	3850	RRP/64 0	3740	Imported from Hariyana
8	PM-58	Biru	7/7/2009	3/28/206 9	NA	NA	RRP/60 7	3710	Imported from Hariyana, India
9	PM-59	Sultan	6/11/200 8	3/28/206 9	NA	NA	RRP/63 9	3686/305	Imported from Hariyana, India
10	PM-60	Arjun	5/15/200 9	3/28/206 9	NA	NA	RRP/66 8	2516/300	Imported from Hariyana, India
11	PM-61	Ram	11/27/20 11	6/10/201 6	H-52	4120	H-45	3830	Imported from Hariyana,
12	PM-62	Tej	11/26/20 11	6/25/201 6	H-72	4080	H-55	3875	Imported from Hariyana, India

S. N	***Bull No.***	***Bull Name***	***Birth Date***	***Received date***	***Sire No.***	***Sire's dam's milk producti o/ Lactatio n***	***Dam ID***	***Dam's milk productio n/ Lactation***	***Source***
13	PM-63	Deepak	11/29/20 11	6/25/201 6	H-83	4100	H-66	3850	Imported from Hariyana, India
14	PM-64	Ratna	11/1/201 1	6/10/201 6	H-85	4000	H-74	3875	Imported from Hariyana
15	PM 65	Hira	11/5/201 1	6/25/201 6	H-95	4115	H-82	3890	Imported from Hariyana
16	PM-66	Bhim	12/15/20 11	6/25/201 6	H-105	3900	H-94	3910	Imported from Hariyana, India
17	PM 68	Rubi	7/17/201 2	11/10/20 73	H-58	3950	H-50	3790	Imported from Hariyana
18	PM 69	Basanta	10/20/20 13	3/3/2019	HLDB-165	4260	RRP-162	3860	Imported from India
19	PM 101	Pratap	6/19/201 3	6/7/2019	HLDB-205	4200	RRP-68	3950	Imported from India
20	PM 102	Bipu	7/10/201 3	6/7/2019	HLDB-261	4230	RRP-82	3810	Imported from India
21	PM 103	Shambhu	11/26/20 13	6/7/2019	HLDB-151	4180	RRP-150	3740	Imported from India
22	PM 106	Rishi	1/25/201 4	6/7/2019	HLDB-221	4250	RRP-75	3895	Imported from India
23	PM 107	Prem	1/16/207 4	3/25/207 6	6299	3800	N214	3100	NLBO Farm
24	PM-108	Thaneshwar	12/17/20 71	8/16/207 8	Yubaraj	4000	D314	3700	Imported from India
25	PM-109	RAHUL	6/17/207 6	8/16/207 8	Yubaraj	4000	2127	3400	Lachok,Pokhara
26	PM-110	GYANENDRA	7/1/2076	8/16/207 8	5647	4200	N214	3200	NLBO,Pokhara
27	PM-111	SANDEEP	4/14/207 6	8/16/207 8	5647	3100	280	2900	NLBO,Pokhara
28	PM-112	PARAS	5/23/207 6	8/16/207 8	5647	3750	N174	3000	NLBO,Pokhara
29	PM-113	Shakti	5/20/207 7	1/12/207 9	PC1162 2	3200	D243	3100	Imported from India
30	PM-114	SANTA	6/30/207 7	1/12/207 9	5647	3200	N336	3150	Imported from India
31	PM-115	SOM	12/11/20 75	7/6/2078	5647	3200	N335	3150	Imported from India
32	PM-116	NA	11/26/20 76	7/6/2078	5647	3150	N336	3497	NLBO, Pokhara
33	PM-117	NA	11/12/20 75	7/6/2078	5647	3150	N378	3003/270 D	NLBO, Pokhara

S. N	***Bull No.***	***Bull Name***	***Birth Date***	***Received date***	***Sire No.***	***Sire's dam's milk producti o/ Lactatio n***	***Dam ID***	***Dam's milk productio n/ Lactation***	***Source***
34	PM	NA	9/28/207 7	3/25/208 0	Arjun	NA	NA	4320	Imported from India
35	PM	NA	1/7/2078	3/25/208 0	M-29	NA	NA	4140	Imported from India

Note: **NA**- Not available **PJ**- Pokhara Jersey, **PM**- Pokhara Murrah, **PJE**- Pokhara Jersey born by Embryo Transfer, **PHF**- Pokhara Holstein Frisian

2.5 ARTIFICIAL INSEMINATION

1. Organization and Manpower

Though, AI was introduced in the country about 57 years back, networks for providing service to farming community and skilled manpower to render the service, are yet to be developed. Production of semen and supply of LN_2 to the program districts is responsibility of NLBOs, while the Local Governments and Veterinary Hospital and Livestock Service Expert Service Centers run the actual field program. Agencies and organizations involved in running AI program last FY were:-

For Semen production,

- National Livestock Breeding Offices, Pokhara & Lahan

For LN_2 Procurement and Production,

- Procurement and Production: National Livestock Breeding Office, Pokhara
- Procurement and Production: National Livestock Breeding Office, Lahan
- Procurement and Production: National Livestock Breeding Office, Nepalgunj

For Semen and LN2 distribution

- National Livestock Breeding Office,Pokhara.(Districts of Bagmati & Gandaki and some other districts of Lumbini & Madhesh that are not covered by NLBO Nepalgunj & Lahan, 37 districts, 289 Local Governments).
- National Livestock Breeding Office, Lahan. (Districts of State number 1 & 2, 15 districts, 110 Local Governments).
- National Livestock Breeding Office, Nepalgunj.(Districts of State number 6 & 7 and some districts of State no 5, 20 districts, 71 Local Governments).

2. Providing AI Service

Following is the present scenario of AI Service in Nepal.

1. Districts with AI Service: 70
2. Districts with Regular AI Service: 58
3. Districts with Casual/Seasonal AI Service: 12
4. No. of Total Inseminators: 2674 (Actively working inseminators=1952)
5. No. of AI Private Inseminators: 1557
6. No. of Government Inseminators: 722
7. No. of Inseminotors in Community Livestock Breeding Center: 395
8. No. of Inseminators Recorded in the Inseminator's Diary: 2674

AI Services in Nepal as of 2080.3.31, an overview

Species-wise AI Services in Nepal upto B.S. 2079/80

YEAR	CATTLE	BUFFALO	GOAT	TOTAL
095/96	19361	3545	0	22906
096/97	21387	4478	0	25865
097/98	27430	5387	0	32817
098/99	27702	5469	0	33171
099/2000	28769	6479	0	35248
000/01	32857	8308	0	41165
001/02	43980	12495	0	56475
002/03	46684	10999	0	57683
003/04	49068	11120	0	60188
004/05	54012	11428	0	65440
005/06	60184	13492	0	73676
006/07	71597	15844	0	87441
007/08	70503	16146	0	86649
008/09	79305	18960	0	98265
009/10	118492	30769	0	149261

010/11	148467	40689	0	189156
011/12	203288	56878	0	260166
012/13	284505	89824	0	374329
013/14	341334	103920	0	445254
014/15	383301	104609	0	487910
015/16	391709	97650	3774	493133
016/17	444149	121460	9032	574641
017/18	438144	128093	5534	571771
018/19	463707	154413	4499	622619
019/20	426178	143114	8427	577719
020/21	509896	181432	10105	701433
021/22	532297	177990	8366	718653
022/023	**543412**	**166237**	**8827**	**718476**

3. Overall AI When Compared to Last Year

Despite some constraints to collect all the AI reporting from the inseminators all over the country (As the reporting body the then District Livestock Services Offices were no longer in existence) due to inadequate coordination of the stakeholders at district & local level, the total number of AI has remained similar in comparison to the total number of AI of the previous year as shown in the table below.

AI in the year 2079/80 in comparison to AI in previous year.

2077/78			Total	2078/79			Total	Growth %
Cattle	Buff	goat		Cattle	Buff	goat		
532297	177990	8366	718653	543412	166237	8827	718476	0.02

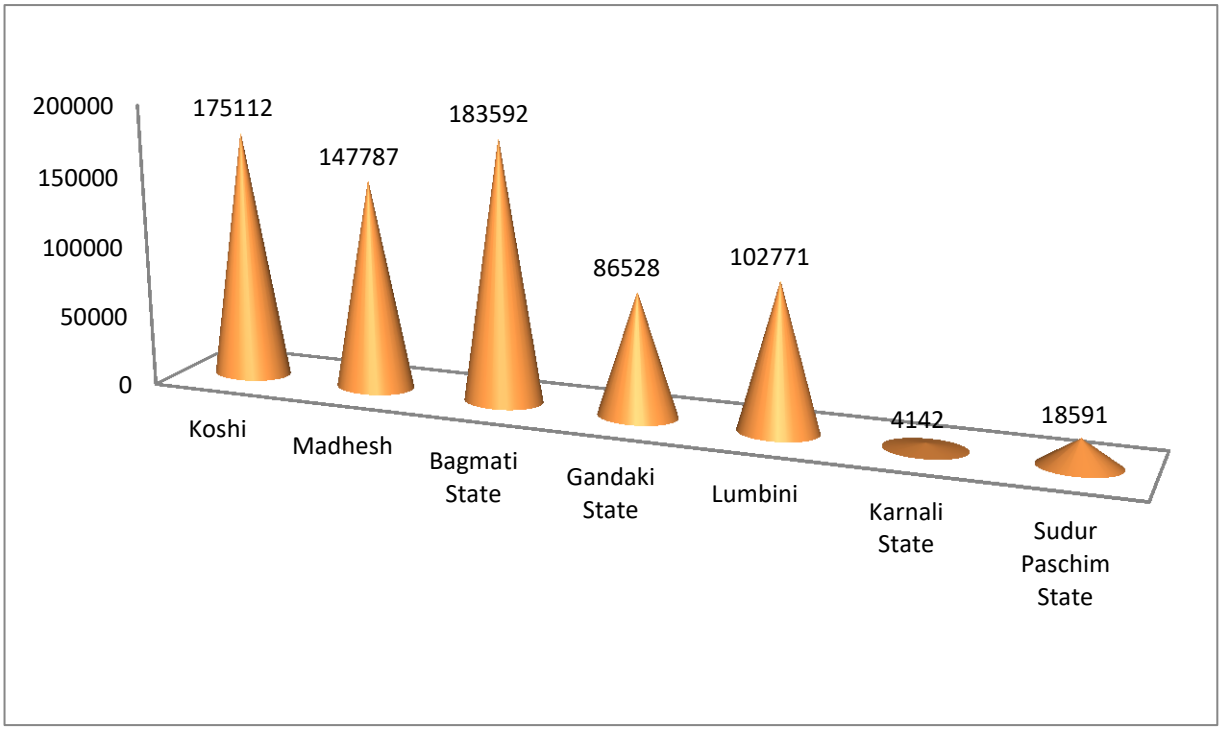
4. State wise AI Report

Distribution of AI number according to the Seven states in the year 2079/80 in comparison to the same in previous year has been presented in the tables below.

State wise AI in the year 2079/80

S.N.	States	AI in 2078.79	AI in 2079.80	Increment in AI (%)
1	Koshi	154959	175112	13.01
2	Madhesh	163345	147787	-9.52
3	Bagmati State	178840	183592	2.66
4	Gandaki State	86815	86528	-0.33
5	Lumbini	109797	102771	-6.40
6	Karnali State	4252	4142	-2.59
7	Sudur Paschim State	20645	18591	-9.95
	GRAND TOTAL	**718653**	**718523**	-0.02

State-wise AI in Graph in 2079.80



4.1) AI in Koshi

S.N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Sub Total	Cow	Buff	Goat
1	Taplejung	024-460176	483	820	669	151	0
2	Ilam	027-521335	14955	22397	21520	791	86
3	Pachthar	024-520127, 469	1749	2922	2501	415	6
4	Jhapa	023- 521161	45702	57889	53711	3425	753
5	Dhankuta	026-520283, 280	1949	2857	2375	482	0
6	Morang with Madan smriti	021-471958	47471	46788	43421	3129	238
7	Sunsari	025-560162	28402	30347	26597	3431	319
8	Udayapur	035-420129	13684	9966	5868	3782	316
9	Solukhumbu	038- 520103	0	39	27	12	0
10	Terathum	026-460127	354	459	338	121	0
11	Khotang	036420107	0	0	0	0	0
12	Bhojpur	029420129	0	0	0	0	0
13	Okhaldhunga	037520210	0	0	0	0	0
14	Sankhuwasabha	029560159	210	627	479	148	0
	Total	**TOTAL**	**154959**	**175111**	**157506**	**15887**	**1718**

4.2) AI in Madhesh

S.N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Sub Total	Cow	Buff	Goat
8	Saptari	031-520308, 142	11592	14077	9336	4687	54
9	Siraha with NLBO	033- 520008, 560273	19384	19799	11026	8640	133
10	Dhanusa	041-520179	29733	22897	12662	10182	53

11	Mahottari	044-520073	24934	19482	12119	7288	75
12	Sarlahi with Ranjitpur Farm	046-520145	23909	21115	13226	7759	130
13	Rautahat	055-520125	18763	16473	9944	5826	703
14	Bara	053-550041	17031	16699	11569	4965	165
15	Parsa (without Bara)	051-522551, 9855035252	17999	17245	11051	6036	158
	Total		**163345**	**147787**	**90933**	**55383**	**1471**

4.3) AI in Bagmati State

S.N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Total	Cow	Buff	Goat
23	Sindhuli	047-520185,9843481500	3353	2434	1429	939	66
24	Sindhupalchok	011-620115, 9841026327,9841753137	486	1145	556	509	80
25	Kavre	011-490266,9851164594	33637	33070	27893	5111	66
26	Lalitpur	01-5547377,9851137970	13577	13756	10745	2915	96
27	Bhaktapur	016-610022	9200	9355	8887	427	41
28	Kathmandu	01-4032201,137	27265	26261	23964	1765	532
29	Rasuwa (Uttarganga & Kalika)	010-540129	1282	1321	760	547	14
30	Nuwakot	010-560012, 9849159785	4034	4289	2829	1388	72
31	Dhading	010-520107	2113	2782	1986	692	104
32	Makawanpur	057412828/9864021707	24535	25775	20187	5405	183
33	Chitwan	056-525097,520176	58676	59057	54503	4154	400
34	Dolakha with Jiri Farm	049- 421115	281	1292	737	458	97
35	Ramechhap	048- 540032, 9854040032	401	1147	879	216	52
	Total		184766	**181684**	**155355**	**24526**	**1803**

4.4) AI in Gandaki State

S. N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Sub Total	Cow	Buffalo	Goat
36	Gorkha	064411251, 9846039308h	2125	1911	773	1076	62
37	Lamjung	066-521231,20131	2360	1942	1010	916	16
38	Tanahun with Bandipur Farm	065-560205	10715	9286	5674	3367	245
39	Syangja	063-420108,9846052191s	3115	4810	1673	3031	106
40	Kaski	061-152082	29706	32316	18397	13597	322
41	Manang		0	175	74	72	29
42	Mustang	069-440121	7	83	41	33	9
43	Myagdi	069-520121	273	700	338	324	38
44	Parbat	067-420123,9857630855	1310	2385	1379	755	251
45	Baglung	068-520121	1976	2029	1305	711	13
46	Nawalparasi-East From Bardaghat	078-520149, 9847297834	35228	32800	26598	5990	212
	Total		**86815**	**88437**	**57262**	**29872**	**1303**

4.5) AI in Lumbini State

S. N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Sub Total	Cow	Buffalo	Goat
47	Gulmi	079-52227	3015	3549	1678	1783	88
48	Arghakhachi	077-420062,9840493638	13197	13170	7820	5165	185
49	Palpa	075-520145\f,9847067265	4405	3001	1568	1411	22

50	Nawalparasi-West from Bardaghat	078-520149, 9847297834	12087	12748	9209	3347	192
51	Rupandehi	071-520206/9851134786	44876	40932	29736	10690	506
52	Kapilbastu	076560021,9865242401	16092	14546	10281	3963	302
53	Pyuthan	086-420014	816	560	286	239	35
54	Rolpa	086-440056	445	380	131	237	12
55	E.Rukum	088-530010	0	0	0	0	0
56	Dang	082-5633604	3741	3312	1942	1254	116
57	Banke with NLBO & Gaughat	081-520254,521020,621243,9857840068	5721	4987	2989	1968	30
58	Bardia	084-420229,9814553981	5402	5586	3512	1876	198
	Total		**109797**	**102771**	**69152**	**31933**	**1686**

4.6) AI in Karnali State

S.N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Sub Total	Cow	Buffalo	Goat
59	Salyan	088-520062	229	409	134	150	125
60	W.Rukum	088-530010	442	183	62	121	0
61	Surkhet	083-520288, 9848038930	2546	2705	1537	1156	12
62	Dailekha	089-420148	618	413	153	164	96
63	Jajarkot	089430030	147	54	27	27	0
64	Jumla	087-520028	236	311	217	41	53
65	Dolpa		0	1	1	0	0
66	Kalikot		30	54	9	23	22
67	Mugu		4	12	3	3	6
68	Humla		0	0	0	0	0
	Total		**4252**	**4142**	**2143**	**1685**	**314**

4.7) AI in Sudurpaschim State

S. N.	Districts	Phone No.	AI in 2078.79	AI in 2079.80			
				Sub Total	Cow	Buffalo	Goat
69	Kailali wuth Budhitola farm	091-524867	7281	6021	3810	1870	341
70	Kanchanpur	099-521176 , 525657	11797	11558	7384	4080	94
71	Doti	094-420114	406	155	128	27	0
72	Dadeldhura	096-420114	694	411	218	150	43
73	Baitadi	095-529306	0	0	0	0	0
74	Bajhang	092421050	377	409	330	79	0
75	Achham	097620102	62	0	0	0	0
76	Darchula	093420104	17	4	4	0	0
77	Bajura	097541064	11	33	13	10	10
	Total		**20645**	**18591**	**11887**	**6216**	**488**
	GRAND TOTAL		**718653**	**718523**	**544238**	**165502**	**8783**

5. A.I. Coverage

Out of the total livestock population in the country, certain number is estimated to have been reared for breeding at a time. If the estimated number of breedable animals (Based on the data of Krishi Diary 2079) given below is assumed to be conceived as per the given estimated conception rate, AI coverage of cattle & buffaloes all over the country can be estimated as below. AI coverage in case of goat population is extremely limited.

Table 10: AI Coverage in Dairy Cattle & Buffalo: 2079/80

S.N.	Breed	Total No. of Animals (CBS, 2023)	Estimated No. of Breedable Animals	Total AI in FY 2079/80	AI Service Coverage (%)	Remarks
1	Cattle	46,00,000	21,50,000	5,43,412	25.27	(Breedable Population Has been Estimated as Per Average Herd

						Composition, AFC, HCP, Calving Interval & Conception Rate)
2	Buffalo	29,00,000	16,10,000	1,66,237	10.32	”
	Total	**75,00,000**	**37,60,000**	**709,649**	**18.87**	

6. Top 10 AI Districts

Name of 10 districts with highest number of inseminations are presented in the Table below. In the table below, the top ten districts in AI of the fiscal year 2079/80 has been presented with their respective position.

Districts	Number of AI in 2079.80				Position
	Cow	Buffalo	Goat	Sub total	
Chitwan	56594	5269	132	61995	**1**
Jhapa	53711	3425	753	57889	**2**
Morang	43421	3129	238	46788	**3**
Rupandehi	25290	14074	383	39747	**4**
Kavre	28277	5010	29	33316	**5**
Sunsari	26597	3431	319	30347	**6**
Kathmandu	25672	1757	682	28111	**7**
Nawalparasi East	22649	4973	24	27646	**8**
Kaski	17185	10289	15	27489	**9**
Ilam	21520	791	86	22397	**10**
Total	**320916**	**52148**	**2661**	**375725**	

7. Conception Rate

NLBOs monitored AI program in various districts and farms of the country and the calculated results have been presented in the Table & graph below, which shows conception rate of AI in cattle to be 56.12% and AI in buffalo is 48.02%. Recently, AI conception for the goat has been reported to be 50% in the recorded places of Jhapa district. As AI cards in many districts were not issued or were not available at the farm during monitoring, reports from some districts do not include exact AI numbers, thus number of AI for those districts have been assumed to be

equal to the number of sample animals (monitored animals). For some districts the sample animals have been selected on random basis, but for the rest, the inseminated animals were monitored in certain pockets of concerned districts keeping individual monitoring record inseminator-wise. It can't be claimed that the results presented below could be error free but the data was calculated to be acuarate to the extent possible from our side. Furthermore, we request all AI concerned officers and technicians to be more responsible in proper recording and regular and proper reporting of AI, so that we could have more effective AI service and reliable monitoring results. The conception rate of the fiscal year 2078.79 has been calculated on an average being based on the secondary data obtained from the AI progress reports sent to us by the inseminators from Terai and hilly districts.

Conception Rate: Cattle & Buffalo from 2064/65(2007/08) – 2078/79(2021/22)

Year / Species	2007/08 (64/65)	2008/09 (65/66)	2009/10 (66/67)	2010/11 (67/68)	2011/12 (68/69)	2012/13 (69/70)	2013/14 (70/71)	2014/15 (71/72)	2015/16 (72/73)	2016/17 (73/74)	2017/18 (74/75)	2018/19 (75/76)	2018/19 (75/76)	2019/20 (76/77)	2020/21 (77/78)	2021/22 (78/79)
Cattle	56.03	54.69	56.15	56.65	56.45	56.12	56.05	55.75	56.00	55.85	56.12	56.15	56.15	57.11	56.12	56
Buffalo	54.93	48.0	46.76	48.28	48,34	48.04	48.00	48.5	48.00	47.64	48.02	48.05	48.05	50.01	48.02	48
Average	**55.48**	**51.34**	**51.15**	**52.46**	**52.39**	**52.08**	**52.02**	**52.12**	**52.00**	**51.75**	**51.78**	**52.1**	**52.1**	**52.12**	**53.91**	52

8. Private Sector in AI

Involvement of private sector in AI is in increasing trend. Mostly private practitioners' (mainly mid-level technicians) have come forward to embrace the job and most of them seem to be ready to invest also. Private AI practitioners who worked in close collaboration with the State and Local Governments last FY has been presented below. Government job holders & retired govt. staff who work as inseminators might not have been associated with AI centres but are working as inseminators.

In total, there are around 3000 inseminators all over the country working today. All the Statewise data of inseminators is verified by NLBO, Pokhara in every five years and the verified data is published as an updated inventory of inseminators. Table below presents the data related to Aritificial inseminators updated upto the fiscal year 2078/79.

Contribution of Private Sector in A.I.

Particular	Insemination center	Inseminators	AI/Insemination Center	AI/Inseminator
Governments	373	722	728	359 (in theYear 2078.79)
Community	378	395		

Private	212	1557		
Total	963	2674 (Active inseminators 1952)		

9. Best Inseminators Reward Report (National Level) 2062/63 (2005/06) to 2070/71 (2013/14) & 2079.80

The then NLBC in order to motivate the inseminators has begun awarding best inseminators since FY 2062/63 (2005/06). For this, inseminators with more than 500 AI/Year in Terai and 250 AI/Year in Hills were selected for further evaluation and best four inseminators rewarded on the occasion of world food day celebration. Presented in the Table below is the list of best inseminators who were rewarded from FY 2062/063 (2005/06) to Date.

Best Inseminators Reward Report 2062/63 (2005/06)-2070/71 (2013/14)

S.N.	Name of the Inseminators	Designation	Office/District	Reward
Best Government Inseminators in FY 2062/63 (2005/06)				
1	Mr. Resham Pyakurel	LST	DLSO Kathmandu	First
2	Mr. Shalik Ram Poudel	LST	DLSO Chitwan	Second
3	Mr. Krishna Chandra Jha	JVST	DLSO Ilam	Third
Best Government Inseminators in FY 2063/64 (2006/07)				
1	Mr. Shalik Ram Poudel	LST	DLSO Chitwan	First
2	Mr. Digambar Chaudhari	JLST	DLSO Rupendehi	Second
3	Mr. Keshav Dhungana	JLST	DLSO Morang	Third
4	Mr. Shiva Ram Shrestha	LST	DLSO Kathmandu	Fourth
Best Government Inseminators in FY 2064/65 (2007/08)				
1	Mr. Devi Ghimire	LST	DLSO Rupendehi	First
2	Mr. Bishow Nath Yadav	JLST	DLSO Makawanpur	Second
3	Mr. Ram Bahadur Deuja	VST	DLSO Bhaktapur	Third
4	Mr. Raj Kumar Saha	VST	DLSO Mahotari	Fourth
Best Government Inseminators in FY 2065/66 (2008/09)				
1	Mr.Yuba Raj Poudel	JVST	DLSO Chitwan	First
2	Mr. Bikaru Yadav	JVST	DLSO Dhanusha	Second
3	Mr. Badri Prasad Baral	JVST	DLSO Morang	Third
4	Mr. Anirudra Pandey	JVST	DLSO Parsa	Fourth

Best Government Inseminators in FY 2066/67 (2009/10)				
1	Mr. Dhurba Chaudhary	JVST	DLSO Rupandehi	First
2	Mr. Thagendra Prasad Aryal	JVST	DLSO Kaski	Second
3	Mr. Dhuga Bahadur Shrestha	JVST	DLSO Sunsari	Third
4	Mr. Bipin Kumar Singh	JVST	DLSO Mahottari	Fourth
Best Government Inseminators in FY 2067/68 (2010/11)				
1	Mr. Bishow Nath Yadav	LST	DLSO Makawanpur	First
2	Mr. Dhuga Bahadur Shrestha	VST	DLSO Sunsari	Second
3	Mr. Thagendra Prasad Aryal	VST	DLSO Kaski	Third
4	Mr. Arjun Karki	JVST	DLSO Kanchanpur	Fourth
Best Private Inseminators in FY 2067/68 (2010/11)				
1	Mr. Chiranjibi Tripathi	Private Paravet	Chitwan	First
2	Mr. Ram Bahadur Basnet	Private Paravet	Chitwan	Second
3	Mr. Chet Narayan Ray	Private Paravet	Nawalparasi	Third
4	Mr. Madhu Poudel	Private Paravet	Bardiya	Fourth
Best Government Inseminators in FY 2068/69 (2011/12)				
1	Mr. Raj Karan Mahato	JLST	DLSO Sarlahi	First
2	Mr. Uttam Lal Das	JVST	DLSO Makawanpur	Second
3	Mr. Dev Raj Parajuli	LST	DLSO Kavre	Third
4	Mr. Ganesh Regmi	VST	DLSO Sunsari	Fourth
5	Mr. Nabin Shiladhar	JVST	DLSO Kailali	Fourth
6	Mr. Kaushal Kiahor Mahato	VST	DLSO Dang	Fourth
Best Private Inseminators in FY 2068/69 (2011/12)				
1	Mr. Tara Prasad Chapagai	Private Paravet	Rupandehi	First
2	Mr. Chet Narayan Ray	Private Paravet	Nawalparasi	Second
3	Mr. Kiran Raj Rijal	Private Paravet	Chitwan	Third
4	Mr. Ram Chandra Bharati	Private Paravet	Nawalparasi	Fourth
5	Mr. Ghan Shyam Tiwari	Private Paravet	Kailali	Fourth
6	Mr. Ram Lal Rokaya	Private Paravet	Banke	Fourth
Best Government Inseminators in FY 2069/70 (2012/13)				
1	Uttam Lal Das	VST	Makawanpur	First
2	Kulananda Yadav	LST	Morang	Second
3	Shankar Prasad Ghimire	LST	Kathmandu	Third
4	Krishna Dhami	JVST	Kailali	Fourth
5	Sattya Narayan Goiet	LST	Nawalparasi	Fourth

6	Bhoj Raj Ghimire	JVST	Rupandehi	Fourth
Best Private Inseminators in FY 2069/70 (2012/13)				
1	Chet Narayan Ray	Private Paravet	Nawalparasi	First
2	Birendra Prasad Yadav	Private Paravet	Rupandehi	Second
3	Ram Bahadur Basnet	Private Paravet	Chitwan	Third
4	Kim Lal Ranabhat	Private Paravet	Kaski	Fourth
Best Private Inseminators in FY 2070/71 (2013/14)				
Estern Region (Government)				
1	Ganesh Prasad Regmi	VST	DLSO Sunsari	First
2	Kailash Prasad Singh	LST	DLSO Jhapa	Second
3	Bishnu Prasad Ghimire	VST	DLSO Sunsari	Third
4	Surya Man Tamang	VST	DLSO Jhapa	Fourth
Central Region (Government)				
1	Yubraj Poudel	VST	DLSO Chitwan	First
2	Resham Pyakurel	VST	DLSO Kathmandu	Second
3	Shalikram Poudel	VST	DLSO Chitwan	Third
4	Bipin Kumar Singh	VST	DLSO Mahottari	Fourth
Western Region (Government)				
1	Satya Narayan Gohit	VST	DLSO Nawalparasi	First
2	Buddhi Bahaadur Deuja	VST	DLSO Nawalparasi	Second
3	Bir Bahadur Chettri	VST	DLSO Rupandehi	Third
4	Sher Bahadur Sharu	JVST	DLSO Kaski	Fourth
Mid Western Region (Government)				
1	Mahanthi Yadav	LST	DLSO Bardiya	First
2	Govinda Rokaya	LST	DLSO Banke	Second
3	Ratna Bahadur Shahi	VST	DLSO Banke	Third
4	Dhruba Lal Shrestha	JVST	DLSO Bardiya	Fourth
Far Western Region (Government)				
1	Arjun Singh Karki	LST	DLSO Kanchanpur	First
2	Man Bahadur KC	LST	DLSO Kanchanpur	Second
3	Krishna Bahadur Dhami	JVST	DLSO Kailali	Third
4	Anita KC	JVST	DLSO Kanchanpur	Fourth
Eastern Region (Private)				
1	Rudra Bahadur Katuwal	Private Paravet	Madam MSP, Jhapa	First

2	Tulasi Niraula	Private Paravet	Madam MSP, Jhapa	Second
3	Lomash Khatiwada	Private Paravet	Morang	Third
4	Madan Khadka	Private Paravet	Jhapa	Fourth
Central Region (Private)				
1	Ishwari Prasad Acharya	Private Paravet	Chitwan	First
2	Ram Bahadur Basnet	Private Paravet	Chitwan	Second
3	Jhamka Bahadur Shrestha	Private Paravet	Chitwan	Third
4	Ishwari Badal	Private Paravet	Chitwan	Fourth
Western Region (Private)				
1	Birendra Prasad Yadav	Private Paravet	Rupandehi	First
2	Ram Chandra Bharati	Private Paravet	Nawalparasi	Second
3	Bhim Narayan Aryal	Private Paravet	Rupandehi	Third
4	Purna Chandra Gaire	Private Paravet	Kaski	Fourth
Mid Western Region (Private)				
1	Madhu Prasad Poudel	Private Paravet	Bardiya	First
2	Som Prasad Chaudhary	Private Paravet	Dang	Second
3	Nawal Kishor Pathak	Private Paravet	Banke	Third
4	Ram Kumar Tharu	Private Paravet	Bardiya	Fourth
Far Western Region (Private)				
1	Shankar Khadka	Private Paravet	Kailali	First
2	Dhaniram Chaudhary	Private Paravet	Kanchanpur	Second
3	Laxmi Prasad Baral	Private Paravet	Kanchanpur	Third
4	Anup Chaudhary	Private Paravet	Kanchanpur	Fourth

Similarly, we had awarded some of the best inseminators with verbal appreciation & some AI logistics in an interaction goasthee to motivate them for AI & AI Reporting during the fiscal year 2079.80 as well.

2.6 ANNUAL PROGRESS REPORT

1. Annual Progress Report

Presented below is the overall Progress Report in Percentage for the year 2078/79.

Fiscal Year	Progress %	
	Weightage Progress%	Financial Progress %
2079/80 (2022/23)	91.99	84.64

2. Financial Details

Financial details of this office till the end of FY 2079/80 are presented below.

2.1) Budget and expenses

Approved Budget and Actual Expenses: 2079/80

Budget Title no	Budget Allocated (in Rs)	Budget Expense (in Rs)	Progress %
312021033	150878000	134424900.68	89.10%
312021034	36823000	24449346	66.40%
Total	**187701000**	**158874246.68**	**84.64%**

2.2) Approved Budget and Actual Expenses: 2057/58 (2000/01) - 2078/79 (2021/22)

Fiscal Year	Approved Budget (NRs)	Actual Expenses(NRs)
2057/58 (2000/01)	25125000.00	18635227.00
2058/59 (2001/02)	17205000.00	17145526.00
2059/60 (2002/03)	6259000.00	5359394.70
2060/61 (2003/04)	9017000.00	8585118.00
2061/62 (2004/05)	9385000.00	8385183.30
2062/63 (2005/06)	8710000.00	8169097.71
2063/64 (2006/07)	9433000.00	9048265.49
2064/65 (2007/08)	11801000.00	10896380.72
2065/66 (2008/09)	12355000.00	12160896.04
2066/67 (2009/10)	19865000.00	18244214.43
2067/68 (2010/11)	30833000.00	27819648.98
2068/69 (2011/12)	42000236.00	41783178.20

2069/70 (2012/13)	33930000.00	30238923.20
2070/71 (2013/14)	84100750.00	80251451.00
2071/72 (2014/15)	54790000.00	46348601.00
2072/73 (2015/16)	69963000.00	47395929.30
2073/74 (2016/17)	67569162.60	60686254.91
2074/75 (2017/18)	109400000	96445000
2075/76 (2018/19)	230984000	192083802.19
2076/77 (2019/20)	226874000	160742258
2077/78(2020/21)	212683000	175897688
2078/79(2021/22)	**199389000**	**149112885**
2079/80(2022/23)	**187701000**	**158874246.68**

2.3) Annual Revenue

Revenue: 2079/80 (2022/23)

Revenue Source	Total Revenue NRs
From all the Units of NLBO	44855121.5

2.4) Beruju

Details of Beruju

Fiscal Year	Outstanding Beruju NRs	Cleared %	Remarks
Upto 2077/78	553644		
Cleared in 2078/79	166000	29.98%	
Added in 2078/79	2522611		
Remaining	2882229		

2.7 ACHIEVEMENTS

We consider following works done in 2079/80 as achievements that our office has performed.

1) Semen Production:

Since the beginning of frozen semen production NLBO, Pokhara has been producing & distributing semen to meet the required doses of semen all over the country. The lab after being relocated at Pokhara, has developed infrastructure and laboratory facilities and hence has increased semen production in quality as well as quantity. The lab is capable of producing semen of best quality to fulfill the country's total demand and also to export quality semen, provided enough facilities are created and sufficient resources are made available. Despite the budget suspension during the mid term of the last fiscal year, NLBOs produced 966312 doses of qualitative semen in the year 2079/80 which is 20.61% more than the previous year.

2) Beginning & continuation of Semen Collection from E.T. Bulls

NLBO, Pokhara in collaboration with NARC, began embryo transfer technology in cattle for the first time in Nepal in the year 2059/60 (2002/03). This was initiation of a step to fulfill long waited plan of initiating ET in Nepal to produce superior bulls and bull mothers. The cattle embryos imported from New Zealand few years ago were transferred into cows of government and private farms in Kathmandu, Lalitpur, Bhaktpur, Gorkha, Rupandehi, Dolakha, Bara, Kaski, Chitwan and Sunsari. During the last fiscal year too, the program got continuation.

So far, a total of 179 embryos were transferred resulting 43 pregnancies. Two ET born bulls are now in collection and two bulls born from ET born mother died. Fortunately, two more bulls born from ET born mother are coming into semen production at NLBO, Pokhara in the coming year.

In the fiscal year 2072/73, a training programme of Embryo Transfer was organised by the then Directorate of Livestock Production from Ashad 31st to shrawan 5th 2073. The site for the embryo transfer was selected in the various farms located at Kaski, Gorkha, Tanahun, Kathmandu, Bhaktapur & Kavre. This landmark event is expected to be a turning point in the history of animal breeding in the country as the bulls obtained from ET can contribute in pure genetic material for improvement of genes to increase production and productivity in milking cattle of the country. Continuing the previous works, some of the cattle embroys were transfered to some of the cattle of selected elite herds during the fiscal Year 2079/80 too from which we are likely to get 2 male calves for the breeding purposes .

Participants of Embryo Transfer Technology Training held in Ashad 31st to Shrawan 5th 2073

S.N.	Participants	Designation	Office During Participation
1	Shiva Nath Mahato	Senior Livestock Development Officer	DLSO, Sunsari

2	Dr. Khagendra Raj Sapkota	Senior Livestock Development Officer	RLSTC, Nepalganj
3	Thagendra Aryal	Veterinary Officer	DLSO, Kaski
4	Narendra Kumar Rai	Livestock Service Technician	NLBC, Pokhara
5	Purusottam Bdr. Singh	Livestock Service Technician	NLBC, Pokhara
6	Shiva Lal Adhikari	Livestock Service Technician	NLBC, Pokhara
7	Bir Bahadur Gurung		Animal Breeding Division, NARC
8	Shashi Khadka	Livestock Service Technician	DLSO, Kavre

3) Semen Production- Installation of Latest Laboratory Equipments

With JICA non-project grant, NLBC procured and installed following equipments/machineries in different dates to upgrade the laboratory.

1. IMV IS-4 semen filling, sealing and printing machine.
2. Programmable bio-freezer.
3. Laminar Air Flow Cabinet.
4. 25 KVA Capacity Generator

Furthermore, from the Government Program we have installed Genomax (France) and MPP Quattro (Germany) semen filling, sealing and printing machine with programmable bio-freezer which is the latest machine among south Asia and CASA System which is very new in Nepal. The Air shower system and some other modern laboratory equipments have also been installed in the lab during the year 2077.78. Use of these machines is expected to improve frozen semen quality further while compared to manual machines (IS-1) the lab had been using. These latest equipments used by all the renowned labs all over the world are assets of NLBO and installation and use of these equipments has strengthened the capacity to produce quality frozen semen in large amount. Regular Strengthening of the lab fascilities, repair and biosecurity measures also took place in the fiscal year 2079.80.

4) Lab establishment and production of Frozen Semen started in NLBO, Lahan

The Frozen Semen Production Laboratory established and started at LBO, Lahan from FY 2066/67. At Lahan, we have been producing frozen semen of Murrah, Holstein, Gir, Shahiwal and Hariyana Bulls. A semen filling, sealing and printing machine, Genomax was handed over to NLBO, Lahan by NLBO, Pokhara. Since then, Lahan is producing semen of Murrah Buffalo Bull, Holstein Bull (though very limited in number) and Bulls of Indian origin using latest technology. However, new high tech lab equipments and machineries have been set to produce quality semen at NLBO, Lahan during the fiscal year 2075.76 which has been supposed to increase both the quality and quantity of the semen. 310363 doses of frozen semen was produced from NLBO, Lahan during the fiscal year 2079.80. Recently, NLBO, Lahan has also constructed and established a **Frozen Semen Processing Laboratory & Storage Building** during the fiscal year 2079.80.

5) Initiation of Frozen semen production from Holstein Friesian

The breeding policy, 2055/56 had not allowed to rear the Holstein cattle due to heavy investment and assumption of being unsuitable for Nepalese climatic condition. However, there was huge demand of Holstein by the farmers and the recent Breeding Policy has allowed semen collection/breed improvement from the Holstein bull as well. Because of the former policy, the inseminators were compelled to inseminate the Holstein cattle with Jersey semen which ultimately reduced the milk yield of offspring and caused frustration to the farmers. Some farmers used to receive the imported frozen Holstein semen and the service is also increasing. In this context, we had to start & give continuity to the production & distribution of Holstein semen from the year 2009/2010 AD. Nowadays, Holstein semen has a very high demand across the country.

6) Initiation & continuation of Progeny Testing and Pedigree Performance Recording System

Progeny testing and pedigree and performance recording system was initiated by FAO with the collaboration of Animal breeding division of NARC & NLBO, Pokhara during the year 2008/2009 AD, as one of the partners. FAO has terminated its financial TCP assistance and now NLBC has been shouldering the program for its sustainability. Government of Nepal has recommended this program as one of the important tools for genetic improvement. NLBO chief was given the role of national coordinator and the program was initially implemented in 14 districts. This program gives the initiation of progeny testing at one hand, by other hand will create the resource center of improved cattle and breeding bulls. Some more details of the program has been given in the following chapter of the book. After the country entered federal system,the program has been limited to the 9 districts due to the inadequate human resources and budgetary issues.However, similar model of PPRS program in cattle & buffalo and PRS(Performance Recording System) in goat also is being considered.

7) Initiation of Frozen semen production from the imported bulls from the abroad & top Bulls selected from DCIP/PPRS Herds

Though, two ET born bulls are now in collection, many more imported & selected bulls born from the top mothers of DCIP/PPRS herds with high breeding values have been brought to NLBO, Pokhara for semen collection in the recent years. This program is supposed to have created the resource centers of improved cattle and breeding bulls to some extent. Purchase of selected bulls from PPRS herd will continue in coming years as well.

8) Initiation of Program of Livestock Breed Improvement (AI Mission)

Program of Livestock Breed Improvement (PLBI) was initiated by Government of Nepal during the Fiscal year 2067/068 BS as one of the important tools for genetic improvement. Government of Nepal has given high priority to this program. National Livestock Breeding Office, Pokhara was the leading organization for the program, and the then NLBO, Pokhara chief was recommended as the national coordinator of this program. There was a central coordination committee that provided direction to the program and Director General of DLS is the chairman of central coordination committee. The aim of the project was to produce high milk yielder cattle of Nepalese Jersey and HF within the country. The then DLSOs were the main working organization for the program. NLBO, Lahan and Nepalgunj were the responsible organizations. AI mission Program had contributed a lot in terms of quality AI service in the country. The Mission had also trained a lot of private as well as government technicians for quality AI service.

9. Major Acheivements in Figures (FY 2079.80):

Semen Distribution:

S.N.	NLBOs	Semen Distribution						Remarks
		Murrah	Holstein	Jersey	Buck	Hariyana	Total	
1	NLBO, Pokhara	100632	160659	220121	10427		505977	Supplement/Jarti 14054

Liquid Nitrogen Production, Purchase & Distribution:

S.N.	NLBOs	LN2 Production	LN2 Purchase	LN2 Distribution	Remarks
		Litre	Litre	Litre	
1	NLBO, Pokhara	60010	165836	201289	

Artificial Insemination:

S.N.	NLBOs	Artificial Insemination				Remarks
		Cattle	Murrah	Goat	Total	
1	NLBO, Pokhara	342735	123562	5736	472033	

Animal Distribution(Ruminants):

S.N.	Type of Ruminants	No Distributed	No. of Districts	Beneficiary (No. of family)	Remarks
1	**Murrah Bull**	16	5	39	Including farmer Groups/Cooperatives
2	**Boer Buck & Doe**	64	15	64	"
	Total				

Animal Distribution(Non Ruminants):

S.N.	Type of Ruminants	No Distributed	No. of Districts	Beneficiary (No. of family)	Remarks
1	**Poultry (chicks)**	72146	12	68	Including farmer Groups/Cooperatives
2	**Pig**	427	17	120	"
	Total				

Cultivation of Forages :

S.N.	Title	Unit	Annual Target	Annual Progress	Remarks
1	Teosente	ha	30	30	
2	Napier-General	ha	5	5	
3	Signal	ha	5	5	
4	Super Napier	ha	7	7	
5	Winter forage	ha	18	18	
6	Oat	ha	8	8	
7	Berseem	ha	7	7	
8	Vetch	ha	3	3	
9	Silage	M. ton	1200	1200	
10	Demo plot	ha	3	3	
12	**Total**	ha	68	68	

DAIRY CATTLE AND BUFFALO IMPROVEMENT PROJECT (DCBIP)

1) Introduction

Initially, Dairy Cattle and Buffalo Improvement Program (DCBIP) was a joint program of NARC and DLS for dairy cattle & buffalo breeds improvement. When the project started, Animal Breeding Division of NARC, Khumaltar was the leading organization for the project at central level and National Livestock Breeding Office, Pokhara was next to leading organization for the programs for field implementation. At first, the project was funded by financial TCP assistance of FAO which has now been terminated and Government of Nepal has continued the project with its regular fund since then. Recently, NLSIP project funded by World Bank has also assisted the program. Government of Nepal has given high priority to this program. NLBO Pokhara cheif has been working as the national focal person of this program. There is a steering committee that provides direction to the project and Director General of DLS is the chairman of steering committee. Recently, NLBO, Pokhara has taken overall responsibility of animal registration, performance recording, artificial insemination, data analysis including breeding value analysis and bull purchase on the basis of estimated breeding value for semen collection from the elite herds where bull mothers are reared. As of 31st Ashadh 2080, 3551 animals from 96 herds and 9 districts are being registered, recorded and analysed as per table below.

2) Aim of the project

The aim of the project is to produce high milk yielder Dam/cattle and Sire/bull of Nepalese Jersey and HF within the country. In case of buffalo, Murrah breed has been used to improve the milk yield of the domestic buffalo. To acheive the goals of breed improvement, registered potential bull mothers (cattle and buffaloes on the basis of milk yield records are selected and imported semen from the abroad is used to inseminate such cattle. Monthly milk recording and milk analysis is done from the registered animals to find out the lactation yield and milk content of each individual animal. The strategy behind this program is estimation of breeding value of each dam by pedigree and performance recording scheme. Finally, that helps to find out high milk yielder animal throughout the country and top animals are selected for mother cow and inseminated by imported frozen semen to produce better progeny than mother.

3) Command Area

The project was previously launched at 28 clusters of 14 districts, but now it has been reduced to 9 districts/locations. However, the number of district is again going to increase in coming years as it is a high priority program of DLS. In command area, project has distributed imported frozen semen, AI Refri, AI gun, AI sheath and gloves to every cluster.

At local level, the local governments and VHLSECs are the main working organization for the project. NLBO Pokhara, Lahan & Nepalgunj are responsible organization for LN2 and imported frozen semen distribution to the command districts. ABD, Khumaltar is a helping organization for data analysis and database program to find out breeding value of each mother dam as per requirement.

4) DCIP/PPRS target

DCIP target is to register high producing milking animals under the program. These registered animals are known as nucleus herd and multiplier herd to produce better progeny than mother. The bull calf born by best mother are selected for frozen semen production and distributed to the districts for natural services as well.

WAY FORWARD

Another impact of AI, though not accounted for, is the improvement of local animals, which has been resulting from natural mating of nondescript cattle/buffaloes by AI born male calves in rural areas.

Present Status of DCIP/PPRS Program in Brief(As of 2080.3.31):

SN	District	Herd no	Total Animals in herds			Animal in recording		
			Cattle	Buffalo	Total	Cattle	Buffalo	Total
1	Chitwan	3	739	0	739	373	0	373
2	Dolakha	1	150	0	150	114	0	114
3	Gorkha	1	305	0	305	230	0	230
4	Kaski	21	760	250	1010	505	160	665
5	Kabhre	19	320	80	400	210	50	290
6	Lamjung	1	65	0	65	44	0	44
7	Nawalparasi	22	1273	0	1273	751	0	751
8	Rupandehi	15	780	80	860	586	41	627
9	Tanahun	13	760	0	760	487	0	487
	Total	**96**	**5152**	**410**	**5562**	**3300**	**251**	**3551**

2.8 PROBLEMS/CONSTRAINTS

Despite improvement in many areas still problems being faced by AI program and NLBO, Pokhara office currently are-

1) Inadequate Lab. Equipments & Expertise for Semen Quality test

NLBO laboratory still lacks many equipments needed to increase quantity and improve quality of semen it produces. Though the lab has been continuously working in this direction, following equipments need to be available to improve semen quality further.

i. Air Exhaust System with HEPA filter.
ii. Gas Sterilizer
iii. High power Electrical Backup

2) Lack of Proven/Pedigree Bulls

The bulls kept at NLBO were either selected locally or imported from India, have limited information on their pedigree. This has made us unable to supply semen from pedigree bulls as per the expectations of the farmers/inseminators. Dairy Cattle Improvement Program (DCIP) has been running to tackle such problem; however, it certainly needs huge budget and time to solve the problems of this regard.

3) Inadequate Infrastructures

Since this office was shifted to Pokhara in FY 058/59, infrastructures set up are inadequate and following facilities need to be developed urgently to facilitate smooth functioning of the office:

i) Road:

A separate trail for the movement of farm animals also is a requirement in the long run as the same narrow road is being used as footpath and motorable road by the office staff and pasture access trail by the animals.

ii) Wire Fencing

To protect the office and its grass cultivation area from outer encroachment, it needs to be wire fenced up to 3-kilometer perimeter along its periphery.

iv) LN2 Production/Procurement/ Distribution

Timely availability of LN2 has been the major challenge or limitation of AI program in the country. Despite our all efforts in supply of LN2 it is still irregular and in short of supply. The major problems in LN2 supply are:

- High cost of transportation and requirement of extra manpower than allocated or approved Staff of NLBOs.
- Less Production- the government owned LN2 plants production capacity is very less and the production cost is high because of need of frequent maintenance and high electricity usage.
- Demand of LN2 is increasing whereas transportation facility is decreasing.

v) Shortage of Skilled Manpower and Lack of Human Resource Development Plan

Quality semen production & evaluation needs specialized and skilled human resource. So, a well planned Human Resource Development Document and assignment of such manpower to NLBOs for certain Period for the implementation of DCIP/ Progeny Testing programs, Lab management etc. by means of quality training inside and outside the country is an urgent need of NLBOs.

vi) Extension of AI service in Goat & Pig

Currently, AI service in Goat is occasional/casual & AI in pig is extremely limited in Nepal. However, demand of AI service in goat and pig is increasing day by day as it is very expensive for the farmers to rear and change (to avoid inbreeding depression) the male animals every year in these species too. To make AI service commonly available in these two species, we have to develop all the necessary infrastructures, relavant nucleus herds of high genetic merit, laboratory fascilities, specific training and skilled manpower gradually so that the service can be easily available in near future.

2.9 NATIONAL LIVESTOCK BREEDING OFFICES, Lahan & Nepalgunj

Supporting and running of AI programme is the responsibility of the then NLBC and Livestock Breeding Offices (Now all NLBOs). The then Livestock Breeding Offices store AI equipments and support AI programme by regular monitoring and delivery of equipments to districts of their command area. Recently, a new building of Semen processing laboratory has also been established in NLBO Lahan. This office has started the semen production of Murrah buffalo, Holstein Cattle, Gir Cattle, Shahiwal and Haryana cattle. Presented below is brief introduction of two NLBOs- Lahan and Nepalgunj.

1) National Livestock Breeding Office, Lahan

This office is situated in Lahan Municipality, Ward No. 10 of Siraha District, Madhesh State. It is located 45 km far from district head quarter, Siraha Municipality. Though, this office provides general technical support to the eastern districts for animal breeding programs, it is primarily responsible for supplying frozen semen, liquid nitrogen and other A.I. accessories to the A.I. running districts. The VHLSECs & Local Governments of Eastern region are running A.I. program. Monitoring of AI programs in the Eastern region is another important responsibility of this office. The semen filling, sealing and printing machine has been handed over to NLBO, Lahan by NLBO, Pokhara. Also, NLBO, Lahan recently has established the new high tech semen processing plant as well.

Infrastructures

Land: Area of land: 6 Bigha, 7 Kattha, 10 Dhur
Facilities/Building

S.N	Description	Number	Remark
1	Office building	1	
2.	Officer's quarter (Office chief)	1	
3	Staff's quarter (11 family)	2	
4	Bull shed	1	
5	Generator house	1	
6	Liquid Nitrogen Plant	1	
7	Laboratory	1	
8	Toilet/Bathroom	9	

2) National Livestock Breeding Office, Nepalgunj

This office is situated in Nepalganj-17 of Banke District & Gaughat of Banke, Lumbini State. This office was formed by the union of the then LBO, Nepalgunj and Livestock Development Farm, Gaughat (Gaughat farm), Banke. The office is situated 16 Km south from Kohalpur, East West Highway. This office is responsible for supporting animal breeding programs in general and A.I. program in particular in the certain districts of Lumbini State and all the districts of

Karnali & Sudurpaschim state. At present, this office mainly supports the districts of Banke, Bardiya, Surkhet, Dang, Kailali, and Kanchanpur for regular AI program and other districts of the reason like Jumla, Dailekh, Salyan, Bajhang, Baitadi, Doti, Rolpa and Bajura districts for occassional/seasonal AI. Monitoring of AI program, bulls for natural services and breeding groups of other livestock species also are the major job of this office.

Infrastructures

Land:

Area of land: 1.9 Bigha (Except the land occupied by the then Livestock Development Farm, Gaughat (Gaughat farm), Banke.

Facilities/Buildings

S.N	Description	Area	Number	Remarks
1	Office building (2 Storey)	130.8 Sq.m.	1	R.C.C. Roof
2.	LN_2 Plant Building (1 Storey)	168.6 Sq.m.	1	R.C.C. Roof
3	Shed Within office premises Within the premises of Livestock Development Farm, Gaughat	41 Sq.m. 21 Sq.m.`	2	With corrugated tin roof With R.C.C. Roof
4	Laboratory for semen Production	80 Sq meter	1	Standard Laboratory
5	Tahara	26 Sq.m.	1	With corrugated tin roof

3. Other Details of Different Units of NLBO, Pokhara (Nucleus Herd, Double Track & Pasture Units)

1. Ruminant Production:

A nucleus breeding herd of about 60 breeding Murrah buffaloes has been maintained at the buffalo unit of NLBO farm. Production and distribution of genetically superior Murrah bulls to upgrade native buffaloes is the main objective of this unit. The productivity of the farm herd has been gradually improving due to selection, artificial insemination and improved feeding and management practices.The farm produced 64 Murrah calves and distributed 16 breeding Murrah bulls in the fiscal year 2079.80. The farm has been supplying about twenty to thirty breeding bulls to various parts of the country every year.

We have also established our own Bull Mother Farm for dairy cattle within NLBO Pokhara premises which currently has 41 Cattle of Jersey and Holstein including calves & heifers as of 2080.3.31. Milk Production records and other required details has been taken and is being processed to select the best cow for the bull production in future for semen collection purpose.

Boar goat proudcution has also been started at this farm since 2074.75 fiscal year to establish a nucleus herd of Boar goat. As of 2079.3.31, the goat unit of NLBO farm had 59 adult does, 4 breeding bucks and 117 kids and hoggets. Also, the farm produced 111 kids & distributed 33 breeding bucks in different districts during the fiscal year 2078.79.

A small flock of native Kage breed of sheep reared in the mid-hills of the country has also been maintained at the farm.The rams produced at the farm are sold to farmers for breeding purpose in order to maintain genetic heterozygosity (out breeding) in local flocks. Also, the objective of rearing the flock of Kage breed of sheep in this farm is one of the components of Biodiversity Conservation Program of DLS.

2. Non Ruminant Production

2.1 Pig Production:

The farm maintains about 139 Pigs of all ages and breed including 55 breeding sows and 3 boars of exotic breeds, namely; Landrace, Yorkshire, Duroc and their crossbreds as of 2080.3.31. During the last fiscal year, the Pig Unit of NLBO The major responsibility of this unit is to produce and supply genetically superior piglets to breeder farmers, who further multiply and supply weaners to other farmers for fattening purpose. Artificial Insemination in pigs (using imported frozen boar semen) is in practice in the farm, to ensure genetic purity and superiority of the future generation. Pig unit produced 486 piglets & distributed 427 out of them for breed improvment during last fiscal year.

2.2 Poultry Production:

The NLBO Pokhara's Poultry Unit also maintains about 2000 to 3000 parent stock of New Hampshire and Black Australorp breeds of chicken and a small hatchery to help for the development of rural chickens. Day old chicks of these pure dual purpose breeds are produced and supplied to the farmers of various parts of the country. These birds are found to be economically viable in rural conditions and are able to produce more eggs and meat for rural population as compared to native chicken breeds. During the fiscal year 2079.80, 85838 chicks were produced and 72146 chicks were distributed to different districts.

3.Pasture and Forage Production:

This unit is mainly responsible for year round production and supply of green forage to buffalo, cattle, goat, breeding stocks and sheep units in the farm. Activities of this unit include production of summer, winter and perennial fodder crops. This unit is also responsible for making silage using summer fodder crops for long and dry winter season. This unit carries out daily chores of harvesting, chaffing and transporting green fodders from production fields to farm sheds, transporting silage from trench silos to buffalo barns and maintenance of farm machines and fences.

The farm used 18 and 40 hectares of land for cultivation of winter and summer fodder respectively. Oat and Berseem were the major winter forage crops, while the main summer crop were Teosinte. Maize & Forage Sorghum in addition to these crops were also cultivated in the past. Similarly, the farm maintains about 18 ha of land under Smart Napier, Giant Napier, Red Napier, Co4, Super Napier, Mott and Thin Napier. The Super Napier cultivar is very popular due to its high green matter yield, high protein content, multi-cut nature and better palatability. The farm has been supplying thousands of rooted slips of Napier since many years and can supply hundreds of thousands of sets if there is demand. Other than Napier, the farm also grows Signal, Joint Vetch, Guinea, Forage peanut, Paspalum, Desmodium, Setaria, Mulato and fodder trees like Leucaena, Rye Khanyu, Nimaro etc. NLBO, Pokhara has prepared its own forage calender as well.

4. Location of Nucleus Herds:

The Farm's Nucleus herds are located at Lampatan, Ward Number 14 of Pokhara Metropolitan City, Kaski district, Gandaki State in Nepal. The farm is situated at an altitude ranging from 640 to 770 meters above sea level and at a distance of 200 km towards west from Kathmandu, side by side of Pokhara airport and three km towards the south from Amar Singh Chowk.

5. Soil Type of the Location:

The topsoil layer of the farm land is very thin ranging from 6 to 9 inches with boulder stones in sub-soil layer. The soil is mostly silt loam and poor in organic matter content with PH ranging between 6.3 and 8.0.

6. Meteorological Records:

The mean monthly temperature, rainfall and relative humidity of Pokhara valley are presented in Table 1. The weather data were recorded at Pokhara airport by the Department of Hydrology and Meteorology. As presented in the table the mean monthly minimum temperature in Pokhara ranges between 7.2° C to 22.3° C while the mean monthly maximum temperature ranges between 21ºC to 31ºC.

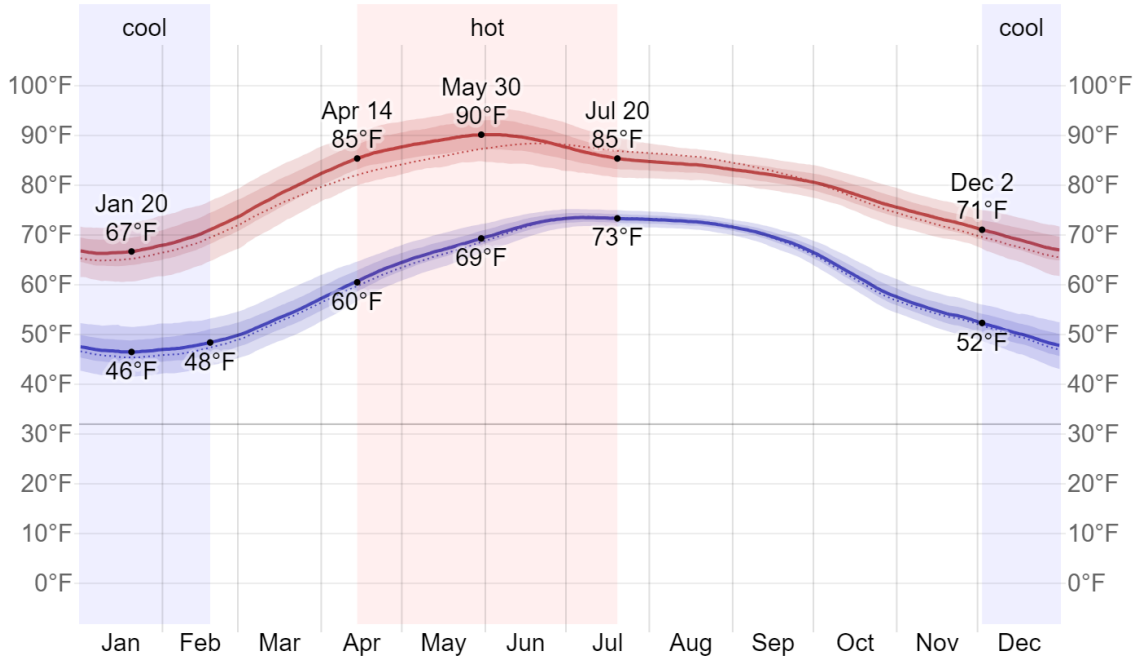
The hot season lasts for 3.2 months, from April 14 to July 20, with an average daily high temperature above 85°F. The hottest month of the year in Pokhara is June, with an average high of 89°F and low of 72°F.
The cool season lasts for 2.6 months, from December 2 to February 18, with an average daily high temperature below 71°F. The coldest month of the year in Pokhara is January, with an average low of 47°F and high of 67°F.
A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Pokhara varies very significantly throughout the year.
The wetter season lasts 3.6 months, from June 6 to September 25, with a greater than 31% chance of a given day being a wet day. The month with the most wet days in Pokhara is July, with an average of 17.9 days with at least 0.04 inches of precipitation.
The drier season lasts 8.4 months, from September 25 to June 6. The month with the fewest wet days in Pokhara is November, with an average of 0.5 days with at least 0.04 inches of precipitation.
Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. The month with the most days of rain alone in Pokhara is July, with an average of 17.9 days. Based on this categorization, the most common form of precipitation throughout the year is rain alone, with a peak probability of 60% on July 18.

Table 1: Average monthly temp, rainfall, and RH % of the year 2010 A.D.

Months	Max temp (^{0}C)	Min temp (^{0}C)	RH% at 0600	Rain Fall (mm)
July	31.0	22.3	79.6	548.8
August	30.5	22.2	84.4	924.5
September	30.9	21.5	79.3	313.5
October	26.8	16.9	79.4	325.5
November	23.6	11.8	78.7	3.6
December	21.0	7.2	74.3	0.0
January	21.4	7.2	74.0	0.0
February	25.5	13.3	70.0	5.3
March	27.3	12.9	61.0	83.5
April	29.2	15.8	67.0	147.0

May	30.4	19.8	75.0	586.7
June	30.5	21.4	81.0	493.8
Overall	27.3	16.0	75.3	3,432.2

Courtesy: Department of Hydrology & Meteorology,2010



Source: https://weatherspark.com/ Accessed in 2023/08/08

Kaski district receives maximum rainfall in Nepal and as can be seen on the Table 1, about 60 percent (2,112 mm) of the total 3,432 mm rainfall in Pokhara valley occurs during first trimester (July to October) of the year.

The winter in Pokhara is cool and dry and almost all the vegetation during this season turns into brown and it requires preservation of surplus summer fodder crops as silage, purchase of rice straw and a large amount of concentrates necessary to maintain farm ruminants.

7. Physical Resources:

7.1 The Land: Area and Use:

The farm, in its early years owned an area of 145 hectares, but after handing over 25 hectares to Armed Police, 7 hectares to the then National Livestock Breeding Centre (NLBC), 10 hectares to Pokhara Metropolitan city and 3 hectares to proposed international airport is, at present, left with about 100 hectares only. Pattern of use of the approximately 100 hectares of farm owned land has been presented in the table & figure below.

Land Uses Pattern: (Hectares)	
Upper Terrace Area	
Area under Forage crops	38.00
Perennial grasses	8.00
Introduction Plots	2.55
Silvipasture	0.45
Road, Buildings	6.00
Sub Total	55.00
Lower Terrace Area	
Natural grazing land	38.00
Silvipasture	2.00
Roads, Buildings & Sheds	5.00
Sub Total	45.00
Total Area	**100.00**

7.2 Buildings and Sheds:

Constructed over the years, there are altogether seventy eight buildings, sheds and working yards within the farm premises. The different residential buildings in the farm can accommodate sixty five families and thus most of the staff and workers are residing within the farm premises. The animal housings, sheds and stables can provide adequate space for 200 buffaloes, 450 sheep, 300 Boer Does, 150 Cattle or Bull mothers, 90 breeding sows, 100 Breeding Bull and Bucks and 3000 poultry breeding stock. The main office buildings comprises of 25 rooms and two meeting/training halls at the moment.

7.3 Farm Machinery:

The NLBO owns Six tractors (with the one purchased last fiscal year) out of which only four are in working condition. We also have two chaffer/harvestors in working conditions out of

which two were purchased in the year 2075.76. The green herbage is harvested, chaffed and loaded into trailers by tractor drawn German made one chaff cutter imported in FY 2049/50 and two Indian imported in FY 2070/71. Among three only two Indian chaff cutters are in condition and used to harvest green herbage for feeding buffaloes and ensiling of forage crops. Other machines include power generators feed mixing plant, weighing scales, moldboard ploughs, disc harrows, cultivator, tractor trailers, welding machines, refrigerators, hatchers and incubators. A list of the farm machines and field tillage equipments are presented in Annex 4. The other machines, two tractors, one chaff cutter, one electricity generator and some of other farm implements which are too old to be repaired are included in the list of machines to be auctioned.

7.4 Water Supply:

Prevailing source of water supply in the farm is a deep tube well constructed in 2059/60 by Third Livestock Development Project (TLDP). Since then, the ground water is in use of two organizations the then NLBC and the farm. The water from the deep tube well has been found to be of good quality with slightly higher amount of iron. It contains no other harmful elements or germs and hence is safe for consumption. During the fiscal year 2078.79, an overhead cemented tank of 100,000 litres capacity was constructed.

7.5 Vehicles and Transport Facilities:

One Toyata Hilux pickup, One Ford Pickup, One Mahendra Scorpio, 2 delivery trucks and 12 motorcycles and scooters are there for the operation of NLBO, Pokhara. Two old motorcycles in irreparable condition are included in the auction list. Two Escorts motorcycles were taken away by rebels during insurgency in the year 2061/62 and are not found yet.

7.6 Human Resources:

There are fifty six permanent staff in present NLBO under the leadership of Cheif Livestock Development Officer including drivers and office helpers.

Besides the permanent staff, about forty four men and women work regularly in the various units of farm on daily wage basis. Among them, 5 in Goat & Sheep Unit, 5 in Pig unit, 16 in Buffalo unit, 5 in Poultry unit, 1 in Dairy Unit & 12 in Pasture unit have been assigned and working. A number of seasonal workers are also hired at the time of land preparation, manuring, sowing of forage seed, harvesting, chopping of green herbage and at filling of bunker silos. Additional labors are also required for management of perennial crops, reseeding of grasses, and transplanting and cleaning of farm premises.

Table 3: Number of positions, posts fulfilled and vacant as of 2080.3.31

S.No.	Positions	Class	Posts	Fulfilled	Vacant
1	Chief LDO	G I Tech	1	1	0
2	Senior LDO	G II Tech	3	3	0
3	LDO	G III Tech	7	4	3
4	Veterinary Officer	G III Tech	1	1	0
5	Account Officer	G III Admin	1	0	1
6	Livestock Service Technicians	NG- I Tech	12	12	0
7	Nayab Subba	NG-I Admin	1	1	0
8	Electrical Overseer	NG-I Tech	2	0	2
9	Junior LST	NG II Tech	11	10	1
10	Light Driver	Classless	4	3	1
11	Office Helpers	Classless	13	12	1
	Total		**56**	**47**	**9**

7.7 List of Office Chief:

Following is the list of farm managers who worked in this farm since its' establishment.

S.No.	Name	Service Period	
1	Mr. D.B. Rai	2017/18	2021/03/15
2	Dr. Heramba Bahadur Rajbhandari	2021/03/16	2021/05/26
3	Mr. Keshab Raj Keshari	2021/07/10	2023/11/18
4	Mr. Shatrughan Lal Pradhan	2024/01/22	2024/08/26
5	Mr. Laxman Prasad Tripathi	2025/02/14	2027/04/08
6	Mr. Hitraj Sharma	2027/04/09	2027/10/16
7	Mr. Shrigobinda Sah	2027/10/17	2032/10/27
8	Mr. Sikandar Sah	2032/10/28	2033/04/09
9	Dr. Prabeshman Singh Pradhan	2033/04/10	2039/04/05
10	Dr. Nanda Prasad Shrestha	2039/05/11	2045/05/16
11	Mr. Dalram Pradhan	2045/05/17	2047/03/30
12	Mr. Dan Bahadur Singh	2047/04/01	2066/03/20
13	Dr. Amar Bahadur Shah	2066/03/21	2067/11/01
14	Mr. Bhim Bahadur Gurung	2067/11/02	2068/03/26
15	Dr. Narayan Prasad Sharma	2068/3/27	2071/06/25
16	Mr. Mani Kumar Shrestha	2071/07/17	2073/08/05
17	Mr. Shiva ji Karki	2073/08/06	2073/10/17
18	Mr. Amrit Kumar Maske	2073/10/18	2073/11/07
19	Mr. Shiva ji Karki	2073/11/08	2073/12/26
20	Mr. Shambhu Raj Pandey	2073/12/27	2075/3/31
21	Mr Krishna Kanta Neupane	2075/4/01	2076/02/25
22	Mr Shivanath Mahato	2076/02/26	2076/3/31
23	Dr. Narayan Prasad Sharma	2076/04/01	2078/12/08
24	Dr Jagat Bandhu Nepali	2078/12/09	2079/03/14
25	Dr. Khagendra Raj Sapkota	2079/03/15	2079/04/04
26	Dr. Jagadish Pandeya	2079/04/05	till date

4. Outreach Programs & Biodiversity Conservation

NLBO, Pokhara under outreach resource development program provides technical as well as some meterial supports as subsidy to the livestock resource farmers of selected areas. Following table has a brief account of the outreach programs conducted in the past and last fiscal year.

S.N.	Districts	Livestock Species	Support Programs	Remarks
1	Syangja (Khalte, Pitlek, Sirsikot)	Rural Poultry	Trainings, Chicks distribution, Small Hatchery Distribution, Shed improvement, Other related equipments (Feeder, waterer) distribution, Vaccination, Drenching & Medications etc	Program was implemented in the Past
2	Tanahu (Dagam, Tutepani, Ranagau)	Rural Poultry	"	Program was implemented in the Past
3	Chitwan (Madi), Tanahu(Dhorphirdi), Kaski (Nagdanda), Kavre	Murrah	Trainings, Forage Seed Distribution, Shed Improvement, Breeding Bull distribution, Other related equipments distribution, Vaccination, Drenching & medications, Feed Grinder Distribution etc	Program was implemented in the Past. In case of Nagdanda, Kaski, the program has been continued as followup program.
4	Chitwan	Pig	Trainings, Breeding Purpose piglets distribution, Shed improvement, Other related equipments (Feeder, Waterer, Pig holder etc.) Distribution, Vaccination, Drenching & Medications etc.	Program was implemented in the Past
5	Makwanpur	Pig	"	Program was implemented in the Past
6	Myagdi (Bhakimli)	Goat	Trainings, Breeding Purpose Bucks distribution, Shed improvement, Vaccination , Drenching & Medications etc	Program was implemented in the Past
7	Lamjung (Rainas)	Rural Poultry	Trainings, Chicks distribution, Other related equipments (Feeder, waterer) distribution, Vaccination, Drenching & Medications etc.	Program was started during the last fiscal year

Biodiversity Conservation :

A small flock of Kage, a native sheep of middle hills of the country as part of biodiversity conservation program is also maintained at the farm. Past attempts of crossbreeding in Kage sheep with a number of exotic breeds for the production of carpet quality wool was not very successful. So, crossbreeding has been discontinued and the farm at present maintains a flock of 60 pure breed of Kage ewes and supplies rams to flock owners for increasing genetic heterozygosity in native population.

5. Karya Sanchalan Kosh:

A Karya Sanchalan Kosh (operational fund) according to *Karya Sanchalan Kosh Act, 2043*, was established in the farm in the year 2049/50 and fifty percent of total farm income is deposited into *sanchit kosh* (national revenue) while the remaining fifty percent is deposited into this fund. The fund, after getting approval from the MALD, could be utilized for construction, renovation and purchase of farm buildings, machines, and breeding animals. This fund could also be used to purchase various production inputs and raw materials. In this fund, Rs 1,29,79,236.00 was deposited during the last fiscal year.

6. More Details of Some NLBO Units

1. Pastures and Fodder Unit

There is a short poem that describes the significance of Grass. We have decided that the poem is worthy to be published in this Annual Progress Report as well.

Grass is immortal

Forests decay
Harvests perish
Flowers vanish
But grass is immortal.

It yields no fruits in air or earth
And yet, should its harvest fail
For a single year,
Famine would depopulate the earth.

Major Activities:

- Year-round production and supply of green fodder.
- Conservation of green herbage as silage.
- Production and supply of forage planting materials to the local bodies/farmers.
- Technology transfer through demonstrations and trainings.

Target and Progress:

Presented in Table 12 is major annual targeted activities and progress of this unit.

Table 12 : Target & Progress 2079/80

S.No.	Activities	Unit	Target	Progress
1	Cultivation of winter fodder	ha	18	18
2	Summer fodder cultivation	ha	30	30
3	Perennial fodder crop /production & management	ha	20	20
4	Production of silage	mt	900	900

Forage Calender:

From the fiscal year 2079.80, NLBO Pokhara has designed its own forage calender for the production and use of green roughage round the year. NLBO, Pokhara follows the calender for the cultivation and utilization of the forage since then . The forage cultivation area and the reduced form of forage calender of NLBO, Pokhara is as follows.

Table No: 13

S.N.	Plot No.	Forage/Fodder Cultivated	Actual Area (GPS)
1	1	Oat/Maize/Teosente	1.30
2	2	Berseem/ Maize/Teosente	2.00
3	3	Berseem/ Maize/Teosente	2.37
4	4	Silvipasture 1, Fenced	2.53
5	5	Silvipasture-2, many spp	3.57
6	6	Super Napier Spp	2.35
7	7	Oat/Maize/Teosente	3.46

8	8	Thin Napier Spp	2.00
9	9	Co4 Napier Spp	5.50
10	10	Oat/Maize/Teosente	3.39
11	11-A & B	Oat/Maize/Teosente	5.29
12	12	Oat/Maize/Teosente	5.18
13	13	Mixed Napier & Molato Spp	4.90
14	14	Oat/Maize/Teosente	2.54
15	15	Oat/Maize/Teosente	1.50
16	16	Oat/Maize/Teosente	1.79
17	17	Fodder tree/Silvipasture	2.50
		Total	**53.17**

Table No: 14: Forage Calender of NLBO, Pokhara

Plot No.	Forage	Area (ha)	Required Seed		Fertilizer Required (kg)				Planting Season/Cultivation for sowing	Forage Production & Utilization: 1 for Bishakh & 12 for Chaitra (Silage Feeding from Poush to Jestha)											
			Seed (kg)	Set/Slip(plantno)	Urea	DAP	MOP	FYM		1	2	3	4	5	6	7	8	9	10	11	12
1	Oat	1.30	130		103	170	54	13000	Aswin-Kartik												
1	Maize/Teosente		52		103	170	54	13000	Falgun-Jestha												
2	Berseem	2.00	50		7	261	83	20000	Aswin-Kartik												
2	Maize/Teosente		80		159	261	83	20000	Chaitra-Jestha												
3	Berseem	2.37	59		8	309	99	23700	Aswin-Kartik												
3	Maize/Teosente		95		188	309	99	23700	Chaitra-Jestha												
4	Silvipasture 1 (Mixed forage spp)	2.53			110	0	0	12650	Jestha-Shrawan												
5	Demo plots/Silvipasture-2(Mixed forage & fodder spp)	3.57			155	0	0	17850	Jestha-Shrawan												
6	Super Napier	2.35			124	466	98	23500	Jestha-Shrawan												
7	Oat	3.46	346		275	451	144	34600	Aswin-Kartik												

Plot No.	Forage	Area (ha)	Required Seed		Fertilizer Required (kg)				Planting Season/Cultivation for sowing	Forage Production & Utilization: 1 for Bishakh & 12 for Chaitra (Silage Feeding from Poush to Jestha)											
			Seed (kg)	Set/Slip(plantno)	Urea	DAP	MOP	FYM		1	2	3	4	5	6	7	8	9	10	11	12
7	Maize/Teosente		138		275	451	144	34600	Falgun-Jestha												
8	Thin & other Napier	2.00			159	261	83	20000	Jestha-Shrawan												
9	Co4 & other Napier	5.50			437	717	229	55000	Jestha-Shrawan												
10	Oat	3.39	339		269	442	141	33900	Aswin-Kartik												
10	Maize/Teosente		136		269	442	141	33900	Falgun-Jestha												
11	Oat	5.29	529		420	690	220	52900	Aswin-Kartik												
11	Maize/Teosente		212		420	690	220	52900	Falgun-Jestha												
12	Oat	5.18	518		411	676	216	51800	Aswin-Kartik												
12	Maize/Teosente		207		411	676	216	51800	Falgun-Jestha												
13	Mixed Napier, Setaria, Paspalum etc.	4.90			389	639	204	49000	Jestha-Shrawan												
14	Oat	2.54	254		202	331	106	25400	Aswin-Kartik												
14	Maize/Teosente		102		202	331	106	25400	Falgun-Jestha												
15	Oat	1.50	150		119	196	63	15000	Aswin-Kartik												
15	Maize/Teosente		60		119	196	63	15000	Falgun-Jestha												
16	Oat	1.79	179		142	233	75	17900	Aswin-Kartik												
16	Maize/Teosente		72		142	233	75	17900	Falgun-Jestha												
17	Silvipasture 3(Mixed forage & fodder spp)	2.5			109	0	0	12500	Jestha-Shrawan												
	Total	**53.17**	**3707**	**0**	**5727**	**9601**	**3016**	**766900**													

Human Resource Assigned:

Table 15 presents human resource assigned exclusively to this unit.

Table 15 : Manpower Assigned

S.N.	Designation	Responsibilities
1	Livestock Development Officer	Recording, Supervision
2	Livestock Service Technician -I	Supervision
3	Livestock Service Technician -II	Supervision
4	Office Assistant-I	Watchman
5	Office Assistant-II	Water Pump Operation, Water Supply, Maintenance
6	Daily wage based workers (17)	Green Matter Harvesting

Green Herbage Production:

Annual Fodder and Forage Crops:

Summer Fodder Crops:

Teosinte (Euchlaena mexicana / Zea mexicana/Makaichari):

Teosinte, in many ways resembles with maize and sorghum crops. This is well established main summer fodder crop grown in the farm. In addition, it is free from insects, diseases and pests. This crop tillers like *bajra* and yields more than maize. It needs heavy, rich soil and responses well to Farm Yard Manure and nitrogenous fertilizers. If sown early three cuttings of green matter can be obtained. However, in recent years, many varieties of different production potential have been developed.

The chopped green Teosinte fodder is fed to buffaloes and used for ensiling as well. It should be harvested at pre-tasselling stage as both the quality and green matter yields decline if harvested after maturation.

A weed Johnson grass (*Sorghum helipens),* affecting green matter yield and palatability of fodder, has appeared in Teosinte crop since last few years. Johnson grass is perennial and disperses both by seeds and stolons. The seeds of this weed mature early and shatter for propagating further. The general control measures recommended and followed are continuous grazing /over grazing and burning.

Total 1776 tons of green herbage from Teosinte was produced from 28.82 ha of land at the farm last year, out of which 200 ton was cut, chopped and fed fresh and remaining 1576 tons was used for silage production. The overall green matter yield of Teosinte crop was found to be 61.62 tons/ha on average and 100 tons/ha for the double cut plots.

Winter Forage Crops:

About 15 hectares of the farm land has facility of surface irrigation, which makes cultivation of winter fodders like *Berseem or Egyptian clover (Trifolium Alexandrinum)* and *Oats (Avena sativa)* possible. The winter in Pokhara is cool and dry and whole ground cover during this season turns brown. So, the green matter production and supply during this season is possible only through cultivation of winter fodders species like *Oats, Berseem* and *Vetch.*

In fiscal year 2079/80, this farm has produced 978 tons of green grass from *Oats* and 350 tons of green grass from *Berseem* by cultivating these crops in 24.45 ha and 4.37 ha of land respectively. The average green matter yield per hectare was found to be 48 tons for *Oats* and 72 tons for *Berseem*.

Perennial Fodder and Forage Crops:

Napier / Elephant grass (*Pennisetum purpureum) :*

Napier is also called 'elephant grass' due to its tallerness and vigorous vegetative growth. Hybrid Napier for eg, Super Napier, Giant, Red, Smart, Co3, Co4, Co5 etc, in comparison to thin Napier, produces more tillers and numerous leaves and grows faster and produces more herbage. Recently Super Napier, Giant, Red, Smart, Co3 & Co4 Napier have also been introduced into the Farm. Similarly, Co3, Co4, Co5, Super & Pusa Giant Napier has larger leaves, softer and less persistent hairs on leaf blades and sheaths and less sharp leaf edges. The stems of Super, Red, Smart, Co3, Co4, Co5, Super & Pusa Giant are less fibrous than Thin Napier and tillers are more numerous and grow faster. Napier yields higher green matter and is free from diseases and pests. Napier can be easily propagated by stem cuttings or rootstocks. The green matter is available throughout the non-winter period. It is a perennial crop and can also be grown in slops, less fertile areas and in hedgerows. Thus, it is also useful for soil conservation purpose.

Hybrid Napier, containing on an average about 13-18% protein and 30% fiber is superior in quality than Thin Napier grass as herbage of hybrid is more palatable. Some of the Napier varieties may content higher amount of oxalate due to which calcium deficiency in the farm animal can be observed if fed Napier regularly and in high amount. This problem can be mitigated by harvesting at longer intervals (45 to 60 days), feeding the Napier grass mixing with other forage crops & cutting the grass during the evening hours. The Napier is ideal for green fodder, silage and hay.

The Napier verieties being grown at Lampatan are *Super Napier*, Red Napier, Smart Napier, Giant Napier, Thin Napier, Napier-Bajra hybrid (NB 21), Mott, Co-3 & Co-4 . The hybrids of Napier and Bajra (pearl millet) are sterile. The dwarf Napier 'Mott' was released by the University of Florida, USA. It is very leafy and makes good forage for cut and carry or

grazing. This variety of Napier was brought by Mr. Dala Ram Pradhan, former DG, of DLS and was introduced at Pokhara farm. Its multiplication in the farm started in 1995 and at present, it has extensively spread from Terai to mid hills of Nepal. The TLDP played a major role in the spread of Mott Napier in the country and it has become very popular among dairy farmers of Nepal. Recently, Super Napier has become even more popular because of higher protein content and higher biomass yield at the same time. We are also planning to introduce and extend a perennial grass popularly known as Smart Napier here among farmers in coming days.

The hybrid Napiers are also known for their high yield, high palatability, high leaf stem ratio and low oxalate contents. These crops need heavy doses of Nitrogen for better biomass production. They remain in dormancy during winter season. The green matter yield starts to decline after five years of plantation. The average green matter production of Napier grass at Lampatan in 2079/80 is around 160 to 200 Metric Ton/ha/year. However, the green matter production of the selected plot of Super Napier grass planted in 4 ha at Lampatan in 2079/80 was around 300 Metric Ton/ha/year when 5 cuttings were harvested.

Other Perennial Forage Crops:

Other perennial forage crops grown at Lampatan are Signal grass (Bracharia decumbens), Guinea grass (Panicum maximum), Paspalum plicatulum, Setaria (Seteria anceps), Forage peanut (Arachis pintoi), Joint vetch etc. All of these fodder crops are grown in silvi-pastoral system. Guinea grass and forage peanut are shade tolerant species and are therefore found suitable for growing in silvipasture.

Guinea grass (*Panicum maximum*):

Guinea grass, an excellent fodder is valued for its high productivity, palatability and good persistency. Since it can tolerate shade and drought, it suits best in silvi-pastoral system. Perennial Guinea grass once planted can be productive for 10-15 years.

Both seeds and slips can be used to plant Guinea. Since seed germination is poor, vegetative propagation is preferred over seed. If seeds are used (3 kg/ha), it should be sown in nursery and then the seedlings are transplanted. Guinea grass can also be mixed with leguminous fodder crops such as Cowpea, Stylo and Siratro.

Guinea grass is nutritious, palatable and free from oxalates. It makes good hay and silage. The crude protein and the crude fiber content of this grass vary from 8 to 14% and 28 to 36%, respectively.

Signal Grass *(Brachiaria brizantha)*:

Signal grass is a perennial and stoloniferous pasture grass and provides good ground cover.

It is found to be drought tolerant and responds well to nitrogen. Signal grass can be best grown from seeds than from vegetative prapagation in the new field. It suits to a wide range of soil. It is often recommended to be grown with forage peanut and such like shade tolerant perennial hardy legumes.

Forage Peanut (*Arachis pintoi)*:

Forage or perennial peanuts are creeping, low growing legumes native to Brazil and make a dense cover. They are somewhat slow to establish and spread. They may be grazed and are useful as they need low maintenance and provide permanent covers for erosion control and beautification. Propagation is done by rhizomes however very little seed can be produced. They are shade tolerant and hardy and often withstand against over grazing.

Fodder Trees and Tree Fodders:

Many fodder trees of native species including imported fodder tree like Ipil-Ipil are grown within the farm areas. They serve as a fodder bank for dry winter period. But presence of hard pan in subsoil layer of the farm land is a constraint of growing fodder trees as it obstructs root system from further developing. Therefore, the fodder tree species that can grow moderately are listed in table 17.

Table 16: Fodder tree species in Lampatan:

S.N.	Nepali Name	Scientific Name
1	Badahar	*Artocarpus lakoocha*
2	Bakaino	*Melia azedarach*
3	Berulo/Gedulo	*Ficus clavata*
4	Chiuree	*Aesandra butyracea/Basia butyracea*
5	Chuletro	*Brassaiopsis hainla*
6	Dabdabe	*Garuga pinnata*
7	Ipil-Ipil	*Leucaena diversifolia*
8	Ipil-Ipil	*Leucaena leucocephala*
9	Kabro	*Ficus lacor*
10	Khanayo	*Ficus semicordata*
11	Kimbu	*Morus alba*
12	Koiralo	*Bauhinia varigata*
13	Kutmiro	*Litsea monopetala*
14	Nemaro/Timilo	*Ficus roxburghii*
15	Painyu	*Prunus cerasoides*
16	Pakhuri	*Ficus glaberrima*
17	Tanki	*Bauhinia purpurea*

Cost of Silage Production:

For nearly six months of a year, the farm depends mainly on about 900 tons of silage prepared from Teosinte for feeding buffaloes. The fodder crop, for preparing silage is harvested and chaffed by the tractor drawn harvester at pre-blooming stage. The chaffed material then is filled in the bunkers and pressed by tractors to make anaerobic environment in which lactic acid producing bacteria act on soluble sugars present in the green fodder producing lactic acid and lowering pH. This chemical process is known as fermentation and as the low pH in the grass heap resulting from this process does not permit growth of undesirable microbes in the silage and can be preserved for longer period of time.

Table No. 17: Cost of Silage Production (Rs.)

Item	Cost Rs
Fuel	190000
Wages	460000
Polythene sheets	110000
Molasses	0
Repairing (Including casual repairing for unexpected accidents & crane cost as well for this year)	260000
Depreciation & Financial Cost (Bunker, Tractors, Machineries etc.)	220000
Cost of Green matter /kg @ Rs. 0.95/kg for 1576000 kg	1528720
(including wastage in the field & transport)	
Total Production Cost	2768720
Quantity of silage made (tons)	**900**
Cost of /kg silage Rs.	**3.08**

As illustrated in Table no. 17, the cost incurred to produce a kg of green fodder of Teosinte was Rs 0.95. Thus, the costs of producing per kg of fresh silage last year was Rs 3.08.

Buffalo: The Black Gold

Though I am black, my milk is white,
People feed me poorly, I improve their diet,
They also raise me for meat and traction,
Their satisfaction is my satisfaction,
Please love me and don't hate,
My milk is rich in SNF and fat
Improve me more as I have told.
As you know that I am black gold.

(Courtesy: Buffalo News Letter, July 1955)

भैसी : कालो सुन

सेतो छ दूध मेरो, रंग कालो पाए पनि,
पोषिलो दूध दिने गर्छु, घाँस, पराल खाए पनि,
पाल्छन् मलाई दूधको लागि, लिन्छन् मासु र काम समेत
सन्तुष्ट छु बिक्री हुँदा र मालिकले पाउँदा दाम समेत
मलाई हेला नगर र कृपया माया गर,
प्रोटिन, एस.एन.एफ. र फ्याट भएको, पोषिलो मेरो दूधलाई हेर,
बिन्ती छ मेरो बिन्ती छ, मलाई अझ माया सुधार गर,
तिख्खर कालो सुन हुँ म, यो सत्यलाई बिचार गर ।

अनुवादकः डा. अमर बहादुर शाह

Buffalo Production Unit:

Introduction:

Buffalo milk and meat play an important role in national economy of Nepal. Out of the total milk produced in country, buffaloes contribute approximately 64% while share of cattle is about 36%. Buffalo milk contains high fat percent, fetches higher prices in market and is preferred by consumers in comparison to cattle milk. According to MALD buffaloes also contribute about 53 percent in total meat production in the country followed by goats (20%), chicken (17%), pork (8%) and others 2% approximately.

Buffalo unit at Lampatan was initiated in the year 2027/028 BS (1971/72) with a total herd of 13 murrah buffaloes brought down from the then Livestock Improvement Section, Khumaltar and Livestock Development Farm, Tarahara Sunsari.

The breeding tract of Murrah breed is Rohtak, Hisar and Jind districts of Haryana and Habha and Patiala districts of Punjab in India. These animals have long been selected for milk and curled horns. The tail is long reaching up to the fetlocks. The color is usually jet black with occasional white markings found on tail, face and extremities. The udder is well developed.

In case of our country, the average lactation yield of murrah is 1500 to 2500 kg while the age at first calving is 45-50 months in villages but in well managed herds it is as low as 36 to 40 months in better managed herds. The inter-calving period is 450-500 days. The body weight of adult female ranges from 430 to 500 kg and that of a male is 530-575 kg. The

bullocks though slow are powerful.

At present about sixty pure Murrah buffalo cows and their offsprings are maintained at this farm. The main activities of this unit are production of buffalo calves and supply of genetically superior Murrah bulls for upgrading native buffaloes.

Objectives:

- To establish nucleus breeding herd of Murrah buffaloes.
- Production and supply of genetically superior bulls for crossbreeding/upgrading.
- To help technology transfer and extension activities.

Manpower:

There are six permanent staff working in ruminant unit. They are responsible for overall management of buffalo and sheep stationed at the farm. Besides, the permanent staff, the unit also employs 14 workers on daily wages basis to carry on its routine works.

Table 18 : Manpower assigned

SN	Designation	Responsibilities
1	LDO	Unit In-charge, supervision & AI in Buffalo Unit
2.	LST	Supervising, Milk Recording in Sheep Unit
3	JLST	Supervising, Milk Recording Buffalo Unit
4	JLST	Supervising, Milk Recording Buffalo Unit
5	Worker	Milking buffaloes
6	Worker	Cleaning, grazing, feeding & milking

NB : LDO - Livestock Development Officer, JLST = Junior Liv. Service Technician

The daily works of this unit include feeding, watering, grazing, cleaning and milking the animals. They also render treatment service as needed and keep various technical and financial records.

Besides this, the unit is also responsible for digging of bunker silos, taking out and loading the silage on the trailers and transporting it to buffalo barns. Sale of milk, manure, and culling of animals, monitoring of estrous cows and AI services are supervisor's routine jobs in this unit.

Buildings and Sheds:

Table: 19 shows the sheds and facilities available for buffalo unit. There are altogether eight sheds that can accommodate about 300 heads of buffaloes. The loose house shed (SN. 8 Table 23) was initially built in lower terrace in year 2040/41. Since the shed is being used by Pokhara metropolis for landfill management, the new shed of same capacity and quality was constructed on plot number 8 as compensation.

There are three sheep sheds that altogether can accommodate 450 sheep. As the number of sheep at present stationed at the farm is low some of the sheds are also used for storing rice straw during winter season. Recently, two goat sheds have also been constructed, out of which one is underconstruction.

Table 19: Buildings & Sheds

S.N.	Type of Sheds	Area Sq. m	Capacity	Year of constructionn	Initial Costs Rs (in 000s) Rs in 000
1	Bull shed	145	6 heads	2026/27	50
2	Single Row shed	337	16 heads	2026/27	100
3	Double Row shed	472	32 cows	2030/31	2714
4	Single Row shed (E)	239	16 cows	2037/38	163
5	Heifer shed (open)	1273	100 heads	2037/38	125
6	Chaff cutter shed	144		2037/38	59
7	Manure platform	1054		2038/39	90
8	Loose House shed ·	435	50 heads	2040/41	440
9	Weaning Yard	157		2040/41	42
10	Weighing scale,	900 kg.		2040/41	42
11	Calf shed	47'2	50 calves	2041/42	338
12	Double row closed		40 heads	2058/59	990
13	Bull Mother Shed			2076/77	8000

Herd Composition of Buffaloes:

Table 20 : Herd Composition of Buffaloes - 2080.3.31

Particulars	He buffalo	She buffalo	Buffalo Y Bulls	buffalo heifers	Buffalo he calves	Buffalo she calves	Total
At the beginning	1	76	6	29	21	40	173

At the end	1	68	15	50	20	34	188

Mcalves - Male calves, Fcalves - Female calves, YBulls - Young Bulls.

Performance of Murrah Buffaloes:

Herd Calving Percent and Calving Interval:

The average number of breeding adult buffaloes (other than listed in culling Stock) maintained on the farm in 2078/79 was 82 and a total of 65 buffaloes calved in that year. Thus, the herd calving percentage according to the number of calving and number of cows present in the herd in FY 079/80 is 79.26% (Table 21).

The calving interval (CI) is the period of time between two consecutive calving. The calving interval (CI) and herd calving percent (HCP) are correlated with each other and when one of the parameters is known the other can be calculated as given in table 21. It shows that when 100% calving from multiparious cows occurs in a herd the calving interval is equal to 12 months and when 50% calving takes place, the calving interval equals to 24 months.

Table 21 : Herd Calving % and Calving interval (months)

Calving %	Calving Interval
100	12.0
90	13.3
80	15.0
70	17.1
60	20.0
50	24.0

Table 22 : Herd calving percent & calving interval in Murrah buffaloes

Particulars	**069/70**	**070/71**	**071/72**	**072/73**	**073/74**	**074/75**	**075/76**	**076/77**	**077/078**	**078/079**	**079/080**
Average No. of buffaloes present in the herd	6.00	66.00	75.00	75.00	73.00	79	61	72	58	65	82

No. of cows calved	33.00	38.00	50.00	47.00	69.00	53	42	62	46	50	65
No. Heifer calves	-	18.00	16.00	6.00	21.00	25	22	55	21	31	33
Herd calving percent	53.00	57.60	66.66	62.66	NA	67	68.85	86.11	79.31	76.92%	79.26%
Age at first calving (months)	-	48.00	45.00	NA	NA	49.5	48.5	44	44.5	44.2	43.6
Calving Interval (months)	22.00	20.83	18.001	NA	NA	17.91	17.42	13.93	15.13	15.60	15.14

Lactation Yield:

The lactation yield (LY), and lactation yield in 305 days (LY 305) have been compiled in the Table 23. Although the data on lactation yield excludes amount of milk suckled by calves, the milk yield has been converted into 4 teats in the next column assuming the yield of all the four quarters should be equal. The lactation yield of buffaloes reared at the farm, as can be seen from the table has been considerably increasing from 1312 liters in 1996-98 to about 2197 liters from 4 teats in 2021/22. This increment in lactation yield is mainly due to selection in the herd and improvement in genetic makeup of buffaloes by the use of frozen semen imported from India.

Table 23: Lactation yield (LY) and lactation yield of 305 days (LY 305)

Years	Lactation Yield (Actual)	Lactation Yield (305 Days, 3 teats)	Lactation Yield (305 Days, 4 teats)
1996-1998	1177.0	1012.0	1312.0
1998-2000	1333.0	1116.0	1416.0
2000-2002	1344.0	1243.0	1543.0
2002-2004	1631.0	1427.0	1727.0
2004-2009	1471.2	1229.3	1639.1
2009-2010	1517.9	1268.4	1691.2

2010-2011	1554.2	1298.7	1731.6
2011-2012	1559.1	1302.8	1737.1
2012-2013	1620.9	1354.4	1805.9
2013-2014	1660.3	1387.4	1849.9
2014-2015	1716.3	1434.2	1912.2
2015-2016	1742.8	1456.3	1941.8
2016-2017	1686.8	1409.5	1879.3
2017-2018	1842.1	1539.3	2052.4
2018-2019	1893.8	1582.5	2110.0
2019-2020	1900.4	1588.0	2117.3
2020-21	1910.6	1596.5	2128.6
2021-22	1914.2	1601.2	2134.6

The new born calves as routine practice are allowed suckling for milk let down and after complete milking of three teats, the calves are allowed again to suckle both the milked and the un-milked teats.

Mortality :

The mortality rate of buffalo calves in the farm till the age of one year has been found 15.38% has been higher primarily due to antinutritional factors/toxicity of the forage. The cause of high mortality was immediately corrected. A higher mortality rate of 18.18 percent was recorded in FY 2067/68 is due to the outbreak of H.S. (Table 24).

Table 24 : Mortality in buffalo calves up to one year of age

	Calves Born			**Mortality**	
Fiscal Year	**M**	**F**	**Total**	**Number**	**Percent**
2060/61	19	17	36	3	8.33
2061/62	18	28	46	1	2.17

2062/63	17	28	45	1	2.22
2063/64	19	16	35	1	2.86
2064/65	17	14	31	1	3.23
2065/66	23	25	48	4	8.33
2066/67	18	25	43	4	9.30
2067/68	15	29	44	8	18.18
2068/69	25	20	45	2	4.44
2069/70	31	25	56	0	0.00
2070/71	20	21	41	3	7.32
2071/72	33	33	66	6	9.09
2072/73	23	24	47	4	8.51
2073/74	37	32	69	1	1.45
2074/75	28	25	53	1	1.89
2075/76	20	22	42	7	16.67
2076/77	31	31	62	6	9.68
2077/78	25	21	46	4	8.70
2078/79	23	27	50	4	8.00
2079/80	32	33	65	10	15.38
Average	474	496	970	71	7.32

Pricing and benefit-cost ratio of buffaloes:

The farm, since 1992 has been pricing breeding bulls and culling buffaloes following a formula developed by the farm and approved by the Department. According to the formula all the buffaloes to be sold are classified in to seven categories on the basis of their breed characters, body weight, milk production, reproduction performance etc. and certain score as presented in Table 25 is allotted to each animal to calculate the price.

0 Table 25 : Category and body score of buffaloes

SN	Category	Score	SN	Category	Score
1	Excellent	2.00	2	Very Good	2.18
3	Good	2.40	4	Fair	2.66
5	Low Grade	3.00	6	Poor	3.40
7	Very Poor	4.00			

Then the price of buffaloes of different categories is calculated on the basis of following formulas -

A. Live Wight Price

$$\frac{\text{Live Weight (Kg) x Whole Sale Buffalo Meat Market Price}}{\text{Score}}$$

B. Milk Price

$$\left\{\begin{matrix}\text{(Average Milk Production}\\ \text{according to body weight}\end{matrix} + \frac{\text{(7-lactation year)}}{7}\right\} \text{x} \begin{matrix}\text{Farm gate}\\ \text{milk price}\end{matrix} \text{x} \begin{matrix}\text{(300 days milked in}\\ \text{present laction}\end{matrix}$$

Where -

Average milk production according to body wight

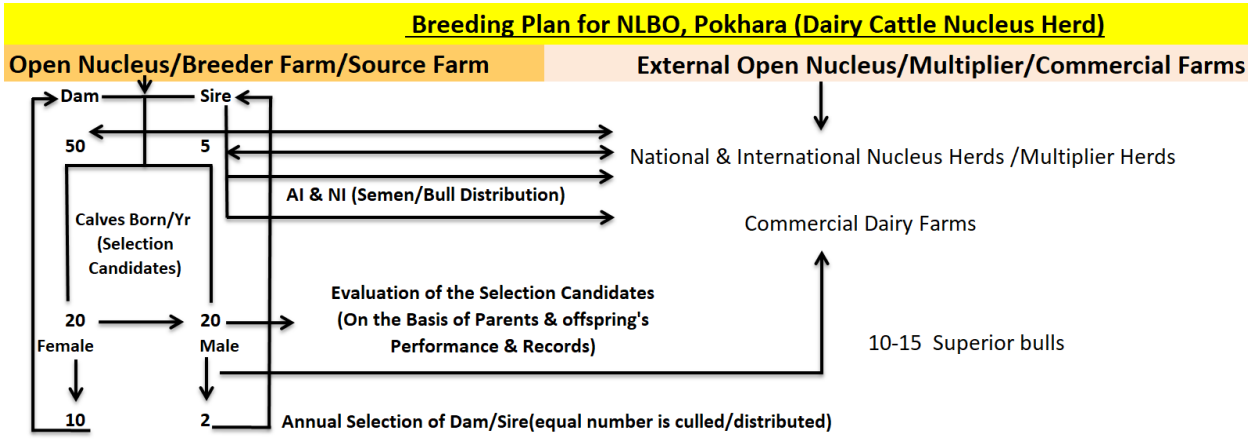
$$= \frac{\text{300 days x average daily milk production}}{\text{Body wight (kg)}}$$

C. Pregnancy Price

$$\frac{\begin{matrix}\text{Average milk}\\ \text{Production}\end{matrix} \text{ x } \begin{matrix}\text{Farm}\\ \text{gate milk}\end{matrix} \text{ x } \begin{matrix}\text{Gestation}\\ \text{Period in days}\end{matrix}}{\text{Age of the buffalo-Lactation}}$$

Thus formula (A) is used to calculate price of bulls and dry and non-pregnant buffaloes while (A) and (B) or (A), (B) and (C) would be the selling price of the buffaloes depending on whether the buffalo is milking and non-pregnant or milking and pregnant also.

Proposed Breeding Plan of NLBO, Pokhara for Dairy Cattle:



Assigning the Dams to the Sires:

Unrelated Sires	M1-M5	(Say M5, Young Bull)
Unrelated/Less Related Dams	F1-F60	Some females assigned for one Sire may be partially related
S.N.	**Assigned Sire & Unrelated/least Related Dams (DOR of females with each other is <3.25)**	
1	M1	F1-F15
2	M2	F16-F30
3	M3	F-30-F45
4	M4	F-46-F60

Replacement Bulls Required/year = Total No. of Bulls / Average Working Bull Lifetime

Maintaining the Degree of Relationship to Avoid Inbreeding:

Dams	Assigned Sire	Expected offspring & Selection (1st Generation)	Replaced/ Died Sire	Selected Sire (from the Nucleus) for Replaced Sire	Assigned First Generation Future Dams for the Selected Sire from the Nucleus	Assigned Initial Dam or unrelated new Dams which are from outside the Nucleus (for the selected Sire from the Nucleus)	Assigned Dams for the Selected Sire which is Outside the Nucleus
F1-F15	M1	2 to 3 out of 15 (M1F1-M1F15)-DOR 50%	M1	M6 (M1)	Other than M1F1 to M1F15	Any Dam as per desired traits	Any Dam as per desired traits
F16-F30	M2	2 to 3 out of 15 (M2F16-M2F30)-DOR 50%	M2	M7(M2)	Other than M2F16 to M2F30	"	"
F-30-F45	M3	2 to 3 out of 15 (M3F31-M3F45)-DOR 50%	M3	M8(M3)	Other than M3F31 to M3F45	"	"
F-46-F60	M4	2 to 3 out of 15 (M4F46-M4F60)-DOR 50%	M4	M9(M4)	Other than M4F46 to M4F60	"	"

Sheep production Unit:

Introduction:

Bhyanlung, Baruwal, Kage and Lampuchhre are the four identified indigenous breeds of sheep in Nepal. Lampuchhre breed is found in Terai (southern plain), while the other three breeds- Kage, Baruwal and Bhyanglung are found in low hills, high hills and mountains respectively. The sheep population in Nepal made up of 12% Lampuchhre, 21% Kage, 63% Baruwal and 4% Bhyanglung and is estimated to be around 80,90,536.

Attempts to upgrade Kage by crossbreeding with a number of exotic breeds have failed in the past. The exotic breeds introduced at the farm for this purpose were Polworth, Border Leicester and Romney Marsh. The crossbreds, while compared to Kage, were heavier with higher daily weight gain and their wool was found to be higher in yield. However, higher the wool quality and quantity produced by crossbred sheep, climatic conditions like high rainfall of Pokhara did not support for grazing in the pasture particularly in rainy season and

the crossbreeding was discontinued. Sheep currently, is in low government priority and as a result only a small flock of native Kage breed comprising of about fifty ewes is maintained at the farm and pure breeding is being continued.

Annual Targets and Progress:

The farm maintains only a small Kage flock and so the unit also has very few activities. Presented on Table 26 are the major activities of this unit showing not much change in last fiscal years 073/74 to 079/80.

Table 26: Annual Targets and Progress

Details	FY 2073/74		FY 2074/75		FY 2075/76		FY 2076/77		FY 2077.78		FY 2078.79		FY 2078.79	
	Tar	Progres	Tar	Progres	Tar	Progres	Tar	Progres	T	P	T	P	T	P
Rearing of sheep	60	68	60	58	60	57	70	62	50	52	50	55	50	54
Production of lambs	50	88	50	48	70	54	70	59	70	49	40	60	40	47

Flock Composition:

The opening and closing stock of sheep during the last fiscal year was as follows (Table no. 27). There were 47 lambs born with 8% pre-wearing lamb mortality and 17% twining.

Table 35 : Flock composition of Kage in the year 2079/80

Particulars	Rams	Ewes	Y Rams	Hoggets	M Lambs	F Lambs	Total
At the beginning	2	35	4	13	0	27	81
At the end	3	30	0	0	1	20	54

Mortality in Kage Sheep:

4 Lambs and 2 adult out of the flock of 81 died during the year 2079/80 and mortality percentage of sheep in the farm last year thus is 7.4 percent for the herds.

Boer Goat Production

Reasons to establish Boer Goat's Nucleus herd by NLBO, Pokhara.

The origin of the Boer goat is not precisely known, although it is believed that the ancestors of the Boer goat were probably kept by migrating tribes in Africa (Casey & Van Niekerk, 1988). Although various breeds of exotic origin such as Jamunapari, Barbari, Sinhal, Kiko, Boer etc have been introduced in the country and are used for crossbreeding with indigenous goats, Boer is the principal exotic breed used most commonly for crossbreeding in the new commercial farms(RDLS, 2015). However, very limited work has been done on carcass characteristics and economic analysis of Khari and crossbreds of Boer and Khari in Nepal. In a study by Tennessee State University, USA live animal visual muscle conformation score was greater for Boer compared to Kiko and Spanish straightbred kids with better meat to bone ratio. (McMillin and Pinkerton, 2006).

The exact date of introduction of Boer goat into our country's goat farms by farmer's level is not yet clarified. Later, Nepal Agriculture Research Council (NARC) had introduced the breed in its research station of Bandipur (GRS, 2017) as a part of its research program. Now the breed and its crosses with different blood level can be seen in limited number in the commercial and semi commercial goat farms throughout the country except in the high hills and mountains (Gautam, 2016).

In an experiment by Browning R. jr. & Browning M.L. (2009), litter size and litter weight at birth did not differ among Boer (1.83 ± 0.04 kids, 5.78 ± 0.12 kg), Kiko (1.84 ± 0.04 kids, 5.63 ± 0.12 kg), and Spanish dams (1.95 ± 0.04 kids; 6.01 ± 0.13kg). Maternal breed did not affect litter traits at birth. However, Boer does exhibited lowered levels of fertility as indicated by parturition rates.

Lehloenya et al., (2005) reported birth weights ranging from 2.3 to 2.5 kg for South African Boer goats following synchronization and artificial insemination. Casey & Van Niekerk (1988) reported mean litter size for Boer goat females of 1.93 kids per parturition. The litter size of Boer goat females varied from 15.2-24.5 % kids born as singles, 59.2-67.5% born as twins and 15.3-16.3% born as triplets (Erasmus, 2000; Greyling, 2000).

In a study involving 826 Boer goat does ranging from 1.5 to 6.5 years old, 7.6% of the kids were born as singles, 56.5% as twins, and 33.2% as triplets(Erasmus *et al*., 1985). The growth rate of Boer goats is generally lower than that of sheep, but under good nutritional conditions, weight gains of more than 200 g per day can be obtained in goats, compared to

maximum values of 176 g per day under extensive subtropical conditions (Van Niekerk & Casey, 1988).

Needless to say, among all superior traits for goat meat production, heavier body weight and faster growing rate are the most notable. According to the Association of Boer Goat Breeders of Australia, birth weight of Pure Australian Boer kids ranges from 3 to 4 kg with male kids weighing about 0.5 kg heavier than female. Kids at weaning can weigh from 20 to 25 kg, depending on weaning methods and age (Lu, 2002).

Another research regarding Boer buck and Khari doe crossbreds in GRS, Bandipur also showed very encouraging result. In cross breeding with Boer by AI & Natural mating, the kidding percentage in natural mating were found to be 40.54%, 54.05% and 5.41% for single,twins and triple, respectively whereas in AI were 83.33% and 16.67%, respectively for single and twins. Likewise, the mortality rate of kid was found to be 16.39 % in natural mating and 14.29 % in AI. The mean body weight of male kids at birth, four and twelve months of age in natural mating was 2.27±0.17, 14.13±0.33 and 35.11±0.29 kg, respectively(Adhikari et.al, 2013). The study had concluded that the growth performance of Boer crossbreed is better than other crossbreeds found in Nepal and can easily adapt in mid-hills of Nepal.

In a study conducted in Syangja and Kaski district of Nepal, Gautam(2016) found that overall mean live body weight of adult does was 23.80±0.34 kg which was not significantly affected by location, production system, parity. However, Live weight of adult does was significantly affected ($p<0.001$) by the genetic group of dams. Accordingly, the does of Syangja district had longer body as compared to those from Kaski. However, production system and parity did not affect the body length of kids significantly.

As a result of all the reasons, facts and finidings mentioned above, in later years, Boer being a relatively newer breed introduced in the country, has become a breed of great concern among goat keepers especially because of its faster growth rate. Many research publications or literatures agree that Boer goat also is competitively prolific as Khari provided better housing, feeding and health management accompanied by its fast growing nature. To address this situation and to meet the enourmously increasing demand of "Breeding purpose Boer" by the Nepalese farmers, the farm has established the Nucleus Herd of this Breed and the herd will be expanded in coming years upto the optimum capacity of this farm.

Size of Nucleus Herd

As of 2080-3-31, Closing balance of Boer Goat in the farm was as below (Table No 36). Similarly, Reproductive & Growth Performances of Boer goat at NLBO, Pokhara can be seen in Table No. 37 & 38.

Table No 36: Composition of Nucleus Herd of Boer Goat at NLBO, Pokhara

S.N.	Stock	Unit	Quantity
1	Breeding Buck	no	3
2	Breeding Doe	no	88
3	Male kids (<3 months)	no	13
4	Female kids (<3 months)	no	19
5	Male kids (>3 months)	no	12
6	Female kids (>3 months)	no	41
	Total		**176**

Table No: 37: Reproductive Performances 2079/80:

Reproductive Parameters	Days
Average age at first Service	330(10)
Average age at first Kidding	475 (10)
Kidding Interval	285 (10)

Note: the figure within the parenthesis indicate the number of observation

Table No: 38: Growth Performance of Boer Goat at NLBO, Pokhara (2079/80)

Age	Male			Female		
	Weight (kg)	Wt gain (gm/day)	No of Observations	Weight (kg)	Wt gain (gm/day)	No of observatuions
Birth	3.5		10	3.2		10
1st Month	8.5	166.6	10	7.5	143.3	10
2nd Month	12.8	143.3	10	11.5	133	10

3rd Month	15	73.3	10	13.5	66.6	10
4th Month	16	33.3	10	15	53	10

Non-ruminant Production

Pig Production Unit

Introduction:
The pig unit in the farm started in the year 2028/29 (1972), with seven sows and three board of Landrace and Hampshire breeds, brought from the then Livestock Improvement Section, Khumaltar, Lalitpur. As there was spread of contagious and fatal disease Atrophic Rhinitis all the pigs in the farm were disposed off in 2031/32. Pig production in the farm resumed with 46 piglets of Landrace, Hampshire, and Yorkshire breeds imported from UK by GADP in 2035/36 (1979) again.

In order to maintain breeding lines in the farm herd weaned pigs of Duroc, Landrace and Yorkshire breeds were imported from UK and Malaysia in 1983, 1986 and 1990. The farm currently uses frozen boar semen of different breeds imported from International Boar Semen, USA and maintains pure lines of exotic pig breeds. Popularity of pig farming in the country is in increase and so is the demand of piglets. So the farm, despite various limitations has been trying to increase piglet production and support breeder farmers of the country.

Objectives:

- To establish nucleus breeding herd of exotic pig breeds.
- Production and supply of genetically superior piglets.
- Supporting pig breeder farmers' group in swine breeding, improving nutrition and prevention of diseases.

Resources Available:
Resources available to this unit are presented in Table 39 and 40.

Table 39: Buildings, sheds and equipment available in the unit

Description	Number	Sq m/capacity	Construction	Cost Rs. (000)
Open pig shed	1	476	2034/35	100
Boar Shed cum feed store	1	167	2038/39	123

Farrowing shed	1	392	2040/41	504
Office cum changing Room	1		2064/065	425
Weighing scale for pigs	1	900 kg	2035/36	NA
Replacement Stock shed	1	25	2072/73	1500
Laboratory(Including AI)	1	120	2073/74	3000
New Shed for Sow & Piglets	1	20 Sows & Piglets	2077/78	9850
New Mating Yard	1	3 Partitions	2077/78	500

Table 40 : Human resource assigned to Pig unit:

Name	Designation	Responsibilities
Unit-in-Charge	LDO	Overall reponsibility
Senior Technician	JT	Records keeping, Super vision
Junior Technician	JTA	Treatment, Feed supply
Junior Technician	JTA	Treatment, Feed supply
Helper	Office Assistant	Feeding, watering, cleaning
6 heads daily paid worker	Wage based Staff	Feeding, watering, cleaning

Annual Targets and Progress:

Table 41 presents annual target and achievement of this unit. Unfortunately, because of disease outbreak during the last fiscal year, our targets for piglets production & distribution could not be acheived.

Table 41: Annual targets and achievement - 2079/80

S.N.	Details	Unit	Target	Achievement
1	Management of pig Nucleus herd	Number	60	62 (Male 5, female 57)
2	Piglet Production	Number	600	486 (Deducting Mortality)
3	Piglet distribution/Sale	Number	500	427

4	Rearing of Replacement Pigs	Number	30	30
5	Procurement of pig frozen semen	Times	1	0
6	Pig Resource development:			
6.1	Vaccination (SF and FMD)	Times	2	2
6.2	Parasites Control in pigs	Times	2	2
6.3	Tagging (Identification), Recording and	Times	2	2

Herd Composition:

The farm had following population of adult, young and piglets at the beginning and closing of the year (Table 43). Though there is high demand of farm produced piglets the farm owing to limitation of housing facilities has not been able to raise more sows in order to increase piglet production.

Table 43: Herd Composition- 2080.3.31 & Piglets Production/Distribution

Breed/Type	Stock @2079.03.31	Stock @2080.03.31	Remarks
Duroc Adult Male	2	2	
Duroc Adult Female	8	13	
Duroc Young Female	2	0	
Duroc Young male	15	0	
Duroc male Piglet	10	8	
Duroc Female Piglet	4	11	
Landrace Adult Male	2	4	
Landrace Adult female	25	32	
Landrace Young Male	1	0	
Landrace Young Female	29	0	
Landrace Male Piglets	39	5	
Landrace Female Piglets	39	6	
Yorkshire Adult Male	2	2	
Yorkshire Adult female	18	15	
Yorkshire Young Male	0	0	
Yorkshire Young Female	10	0	
Yorkshire Male Piglets	8	1	
Yorkshire Female Piglets	10	0	
Cross Adult Male	0	0	
Cross Adult female	2	20	
Cross Young Male	0	0	
Cross Young Female	3	0	
Cross Male Piglets	1	11	
Cross Female Piglets	2	9	
Total with other Stocks	232	139	
Total Piglets Born During FY 2079.80			520
Total Piglets Distributed During FY 2079.80			427

Financial Analysis:

Benefit Cost Ratio:

6 years ago, a comprehensive study on Cost : Benefit ratio of pig unit was conducted in the farm. As per the study, Benefit cost ratio of pig unit in the year 2070/71 was found to be 1.07:1.0 which seems similar to the table below even today.

Table: 44. Benefit: Cost ratio of Pig Unit.

During Year (2078/79), following brief economic analysis has been done for cost and benefit.

Benefits		**Costs**	
Items	Amount Rs.	Items	Amount Rs.
Cash benefits:		Cash Costs:	
Sales of breeding Piglets	3151500	Feed, supplement	3005000
Sale of culled Pigs	360000	Wages	840000
Others	17500	Veterinary drugs	24000
Subtotal	3529000	Repair	10000
Change in stock value	620000	Depreciation cost	25000
Total Benefit	4149000	Total Cost	3904000

Benefit: cost ratio: = 1.06:1

However, interest or financial cost and depreciation of old buildings (As it has been already deducted since the buildings are too old) & other capital hasn't been calculated in this cost.

Analysis of Past Production Performances:

Litter Size Born Alive (LSBA):

The success of a swine enterprises depends largely in the size of the litter delivered at birth and the number of pigs successfully reared up to weaning. Litter size born alive (LSBA) is measured as total number of live born piglets in a farrowing. LSBA in the farm during last

FY 2077/078 for Landrace, Duroc, Yorkshire, DLC, LYC, DYC & DLYC breeds has been Presented below. These figures show improvement over previous farm performance of year 2062 to 2077.78 BS.

Table 45: Litter Size Born Alive (LSBA) and Litter Size at Weaning (LSW)

Breed	Statistic Tools	LSBA		LSW	
		062-76 Average	2077/78	062-76 Average	2077/78
Landrace	Mean	9.20	11.62	8.40	10.78
	Sd	2.30	1.6		1.47
	n	56	23		23
Duroc	Mean	10.30	9.9	8.87	8.9
	Sd	2.80	2.3		2.3
	n	130	13		13
Yorkshire	Mean	10.40	10.44	9.04	9.09
	Sd	2.72	1.65		1.4
	n	83	10		10
DLC	Mean	10.72	10.55	9.50	9.65
	Sd	2.89	3.1		3.01
	n	174	2		2
LYC	Mean	10.25	11.2	8.98	10.7
	Sd	2.75	2.75		2.88
	n	115	2		2
DYC	Mean		11.2		9.92
	Sd		1.75		1.81
	n		2		2
DLYC	Mean		11.6		10.1
	Sd		2.68		2.46
	n		2		2
Herd Average	Mean	10.46	11.4	9.12	9.89
	Sd	3.99	2.66		2.56
	n	583	731		731

Litter Size at Weaning (LSW):

Large litters, having heavy weaners at weaning are necessary for a profit in pork production. The average figures for this trait for Landrace, Duroc, Yorkshire, DLC, LYC, DYC & DLYC crossbred pigs has been presented in the Table no. 45.

Birth Litter Weight (BLW):

BLW depends mainly on litter size at birth and, is positively correlated with the LSB. The average figures for BLW have been found as per Table no 46. These figures also show improvement while compared to the average performances of 2062 to 2077 BS.

Table 46: Birth Litter Weight

Breed	Statistic Tools	BLW	
		2077/78	062-77 Average
Duroc	Mean	15.86	12.26
	Sd	2.55	3.05
	n	20	146
Landrace	Mean	14.25	12.5
	Sd	3.5	3.3
	n	22	162
Yorshire	Mean	12.95	12.8
	Sd	1.65	3.25
	n	15	113
DLC	Mean	15.9	13.68
	Sd	3.44	3.50
	n	10	184
LYC	Mean	16.0	12.68
	Sd	3.72	3.24
	n	5	120
DYC	Mean	15.17	
	Sd	2.5	
	n	10	
DLYC	Mean	14.40	
	Sd	3.4	
	n	20	
Herd Av	Mean	15.3	12.95
	Sd	3.23	3.35
	n	731	2422

Weaning Litter Weight (WLW):

The numbers of pigs at the time of weaning directly affects this trait. This is a function of

both prolificacy and maternal ability. The analysis of 2076/077 data show that WLW of three pure and 4 cross breed types weaned at 35 days were 76.81, 62.55, 63.71, 66.52, 72.86, 66.92 and 68.32 kg for Landrace, Duroc, Yorkshire, DL, Ly, DY & DLY cross breeds respectively (Table 46). These figures have been found superior than the average values for the same trait in the year 2062 to 2077 BS.

Farrowing Interval (FI) & Litter Index (LI):

Farrowing interval (FI) is the time between two consecutive farrowings. The overall average farrowing interval in the farm last year is found to be 170.11, 188, 198.6, 174.5, 172.5 and 157.14 and 164.51 days in Landrace, Duroc, Yorkshire, DL, LY, DY and DLY cross respectively. Litter index (LI) refers to the number of farrowings per sow per year and the calculations here is based on 365 days divided by FI in days.

Age at First Farrowing (AFF) & Gestation Period (GP):

Age at first farrowing is one of the factors to measure the reproductive ability of sows. Earlier the age of first farrowing, greater is the profitability. The average AFF was found to be 14.49, 15.08, 14.69, 10.72 and 11.15 months for Landrace, Duroc, Yorkshire DL, DY and DLY Cross breed sows, respectively (Table 48). The average calculated figures of gestation days in present and previous sows, have observed more or less similar (Table 48).

Table 48 : Age at first farrowing (AFF) and gestation period (GP)

Breed	Statistic	AFF, months		Gestation Period, Days	
		2061/62	062-75 Average	2076/77	062-76 Average
Landrace	Mean	NA	11.14	114.7	114.88
	Sd	NA	1.81	1.23	1.82
	n	NA	16	20	156
Duroc	Mean	14.49	12.0	115.46	114.99
	Sd	2.68	1.60	1.33	1.78
	n	7	28	4	130
Yorshire	Mean	15.08	13.60	116.80	114.48
	Sd	0.95	3.40	1.69	1.56
	n	4	17	6	83
DLC	Mean	14.69	12.21	114.69	114.71
	Sd	1.19	1.79	1.19	1.87
	n	36	39	6	174
DYC	Mean	10.72		114.33	
	Sd	0		1.23	
	n	1		4	
LYC	Mean	NA	11.65	115.57	115.56

	Sd	NA	1.92	1.27	5.86
	n	NA	70	7	115
DLYC	Mean	11.15		116.08	
	Sd	0.65		1.79	
	n	7		4	
Herd Av	Mean	13.21	12.20	114.24	114.8
	Sd	2.23	2.11	1.58	1.61
	n	28	127	51	695

Piglet Mortality (%) According to Age and Breed:

Pre-weaning piglet mortality or survivability of piglets till weaning (35 days old) are the traits important to access the mothering ability of sows. The piglet mortality according to breed and age is has been presented in table no 50.

So, profitability would certainly increase if this pre-weaning loss could minimize. During the last fiscal year of 2079.80, mortality of pigs has been estimated to be 8.08% because of death of whole batch of piglets from some sows.

Table 49 : Breed wise pre-weaning piglet mortality at different age

Live born Piglets in 2079.80	486 +34	
Mortality of Piglets in 2079.80	34	
Mortality Percentge in 2079.80	6.5%	

Pig Breeding Plan:

The proposed pig breeding strategy of Government of Nepal resembles the breeding strategies followed by this farm since last many years. It is conceptualized in the following multi-tired breeding pyramind.

The nucleus farms are placed at the top of the pyramid with emphasis on pure lines of breeds which undergoes intense selection and introduces the improved genetics from abroad especialy through the use of frozen semen. The imported quality frozen semen (Boar of specific breed) and intensively selected gilts of respective breed will be the Great Grand Parent Stock for

production of grand parent stock of specizlized breeds or lines for supplying to the multiplier pig herds.

The multipliers farms occupies middle tier of the pyramid and is an indicaticve of large number of pig herd for multiplication and expansion of superior lines of breeds, multiple crossing of pure lines or breeds from nucleus herds.

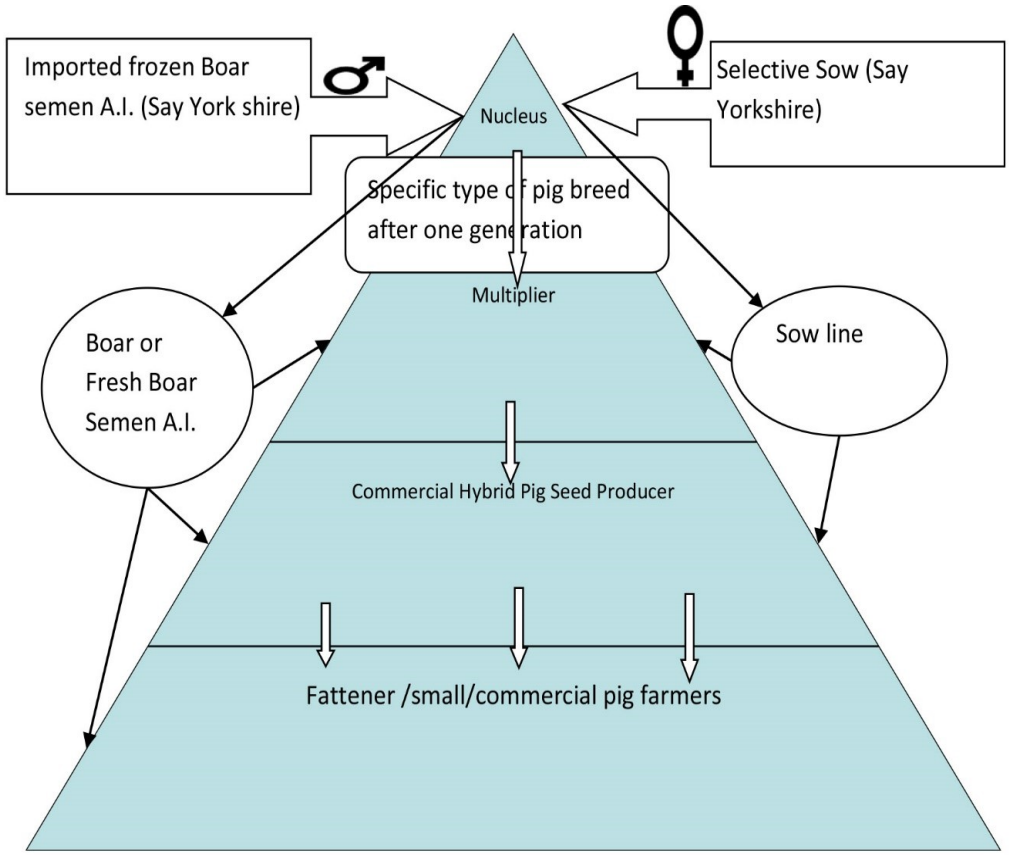


Figure: Pig Breeding Pyramid

The base tier of the pyramid represents commercial pig seed stock producers where large number of parents animals produced at the multipliers are mated using specific crossbreeding schemes to produce a pig and pork that meet the specific market demand.

A very cheap and practical way to carry out genetic improvement is through use of artificial insemination using quality frozen semen from abroad. The dissemination of improved genetics

to commercial pig seed stock producer can further be enhanced by the use of fresh boar semen. The strength of A.I. in pig is generally depended on the genetic superiority of the boar produced at the nucleus herds.

Pure Breeding/Nucleus Breeding:

The farm maintains small nucleus herds of pure Landrace, Yorkshire and Duroc breeds to produce pure breed of pigs. The pure bred weaners are then sold to breeder farmers or used as replacement in the farm. The imported frozen boar semen is used to produce replacement boars and gilts and the first filial generation of crossbred progeny are either sold or used for replacement gilts. Also, the lean meat pig breeds have been given priority while importing the semen.

Two Breed Rotational Cross-breeding (Criss-crossing):

The criss-cross rotational crosses are general-purpose crosses. Offspring of each generation are used for market production and as replacement gilts. In a two-breed rotational program, females sired by breed A are bred to boars from breed B while females sired by breed B are bred to boars from breed A. A rotation of two breeds of Landrace and Yorkshire is followed at the farm.

Three Breed Rotational Cross-breeding:

A three-breed rotation using boars of three breeds rotated in order of one breed per generation is also in practice. Generally some heterosis is lost after the first full round of breeds in a rotation, but relatively high level of heterosis is retained in rotations of three or more breeds. The farm uses Landrace, Yorkshire and Duroc breeds for three-breed rotational program. In this system of crossbreeding the replacement gilts are reared from the same herd. The accurate records of sires in the rotations and sow's pedigree should be maintained to get maximum benefit of heterosis.

Table 50 : Heterosis Percentage in Rotational Crosses.

Heterosis percentage in rotational crosses:							
Crossbreeding system	Generation number						Equilibrium
	1	2	3	4	5	6	
Two-breed rotation	100	50	75	62.5	68.9	67.2	66.7
Three-breed rotation	100	100	75	87.5	87.5	84.4	85.7

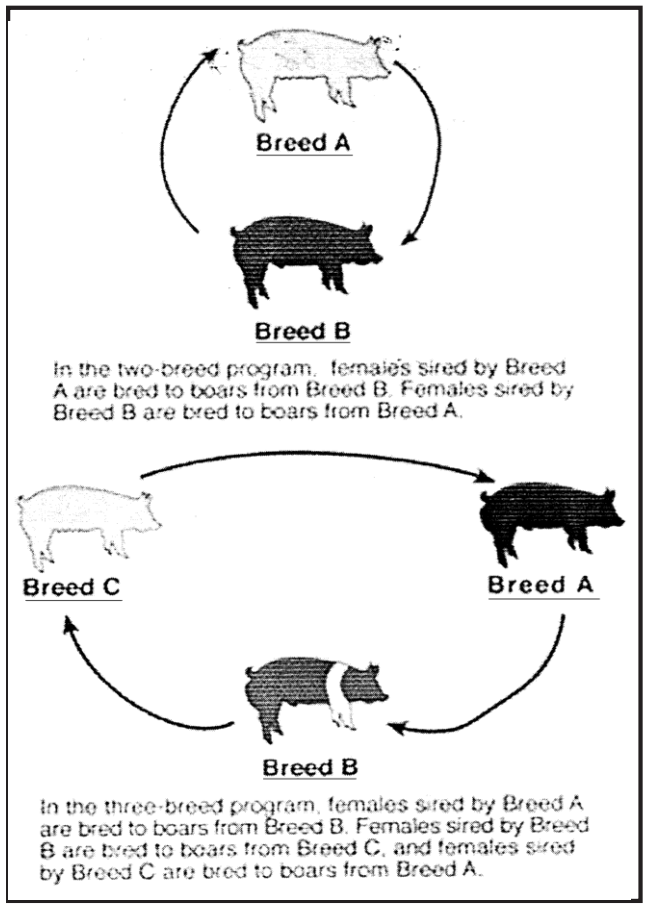


Fig 5 : Rotational Cross Breeding Plan

Following were the major support services provided to the farmers group in the past year (including Outreach Program).

I. Twice a year vaccination against Swine Fever and FMD.
II. Medication against internal and external parasites twice a year.
III Farmers' Training 3 times.
IV. Tagging (identification), recording and monitoring- 3 times.
V. Providing pure and F1 cross bred piglets for replacement.
VI. Technical services as and when needed.

Poultry Production Unit:

Introduction:

The farm included poultry development activities in its program in year 1973. Brooding and distribution of poultry chicks was the initial program. The day old chicks of New Hampshire and White Leghorn breeds were brought from Central Hatchery, Parwanipur, brooded up to the age of four to six weeks and supplied to various districts of Western Development Region.

As the farm had no power supply, kerosene brooders were used for rearing the poultry chicks. A locally made fire wood furnace was also used initially to maintain temperature of brooding house. Later the brooding unit was shifted to the vicinity of DLSO, Kaski at Matepani and electric power was used for brooding and rearing of poultry chicks.

The year 1980 (2037/38) was very important for poultry unit, as two layer houses, one growers house and one hatchery building were constructed with financial and technical support from GTZ/GADP in that year. Similarly, incubators, hatchers and generator also were imported and installed. Parent stocks of New Hampshire, Black Australorp and White Leghorn breeds of poultry were imported and reared as breeding stocks.

The activities of poultry unit like supplying day-old chicks, brooded poultry chicks, fertile eggs, cockerels and dissemination of poultry management knowledge/skills to farmers have been significantly contributing to poultry development in this region.

Objective:

- To support for poverty alleviation among the rural poor people through employment generation.
- To support the rural people for food and nutrition security through the rural backyard poultry program.

Activities:

- Maintaining parent stocks of Australorp and New Hampshire poultry birds.
- Production of day old poultry chicks of Australorp and New-Hampshire breeds.
- Supply of day old poultry chicks, cockerels and hatching eggs.
- Dissemination of modern poultry production technologies to farmers' level.

Annual Target and Progress:

Presented on Table 51 is the target & progress of the annual program of this unit. During Fiscal year, 2079/80, we met the targets of chicks production and almost met the target of

chicks distribution because of our quality chicks production, demand collection & subsidized rate as usual.

Table 51 : Annual program and progress acomplished in FY 079/80

S.No.	Details	Targets	Progress
1	Production of chicks	85000	85838
2	Maintenance of replacement stock	3000	4286
3	Supply of chicks	80000	72146

Resources:
The poultry unit has been utilizing resources mentioned on Table 52 and 53 to achieve its target.
Table 52: Physical facilities available

S.N.	Particulars	Number	Capacity	Date Constructed	Costs
1	Land area	0.8 ha		030/31	100,000
2	Brooding	1	(39X6.5) m2	040/41	645,100
3	house Grower	1	(58.3X9.9)m2	040/41	305,767
4	house Layers	2		041/42	472,481
5	house	1	(25.6X12)m2	037/38	121,193
6	Layers house	1		036/37	
7	Hatchery	2	(34X9.9) m2	036/37	156000
8	building	1		052/53	
9	Incubators	1	(ll.7X9.4)m2 .		
10	Hatchery	2	27000 eggs	068/69	
11	Generator set	1	9000 eggs		
12	New Poultry House		25KVA	072/73 (KUBK)	4000000
13	Free Range Poultry House & Fence	1	500 birds	076/77	3000000

Table 53: Allocation of human resource

S.N.	Designation	Responsibility
1	LDO	Unit- in- charge
2	LST	Supervision, Reporting
3	JLST	Recording, Sales, Hatchery operation
4	Workers/ daily wage based- 6 Poultry boys	Cleaning, feeding and helping

Breeds of Poultry

New Hampshire

History

This breed originated in 1915 in New Hampshire of the United States of America from selection of the Rhode Island Red. They were originally bred for eggs but have gained a reputation as a good table bird also. The body is well rounded with a deep full breast and medium length tail. The head is deep and rather flat on top with prominent eyes, a single comb with five points, smooth face, large wattles and oval red earlobes. The legs are yellow and the lower thighs are large and muscular with feet that have four toes. The feathers are a lovely deep chestnut red and are fluffy and full.

Behaviour

The chicks are quick to feather up and mature quickly. The hens lay well and are placid and friendly and are therefore easy to tame. They are not aggressive towards each other and are tolerant creatures. They do not have a tendency towards broodiness although it can occur occasionally and are good winter layers. They are able to cope with cold weather except that their combs are subject to frostbite so care should be taken.

Egg Colour : Light brown

Australorp:

History:

The Australorp was developed as a utility breed from the Black Orpington in Australia in 1920s primarily for egg production rather than for meat. The name originates from the club which was founded for them. They are excellent layers of tinted eggs and hold the world record for egg production as a hen of the breed laid 364 eggs in 365 days! The feathers of the black birds have a wonderful beetle-green sheen and they have a prominent dark eye. Their comb is single and evenly serrated while their earlobes are red as are their medium length wattles. Their black legs are strong and free from feathers and they have 4 toes.

Behaviour:

The Australorp is an active breed and they are fast growers with hens reaching point of lay at around five months of age. They are amazingly productive and are not prone to broodiness. An Australorp cock will weigh in at around 3.75 Kg while the hens tend to be in the range of 3 Kg.

Egg Colour: Tinted

Flock Composition:

The farm has been producing around 1,00,000 day old chicks every year and in order to meet this production target, maintains about 3000 layers. Presented on table 54 is composition of flock in the farm.

The Farm Performances:

Tables 55, 56, and 57 present eight year farm data on a performance indicators like age at first egg laid, age at 50% egg laying and hen day laying percent etc starting from FY 2061/62.

Table 54 : Flock Composition at the beginning and end of (079/80)

At the beginning of This F.Y.		
Breed	Male	Female
Australop	57	471
New Hempshire	222	1844
Total	**2592**	
At the end of This F.Y.		
Breed	Male	Female
Australop	22	219
New Hempshire	112	1084
Total		

Table 55: Age at first egg lay

Yea	067/6	068/6	069/7	070/7	071/7	072/7	073/7	074/7	075/7	076/7	077/	078/79	079/080
Age	146	130	134	145	138	140	142	139	138	132	135	141	144

Table 56: Age at 50% egg lay

Year	068/69	069/70	070/71	071/72	072/73	073/74	074/755	075/76	076/77	077/78	078/79	079/080
Age	165	166	170	167	165	170	168	169	167	165	171	168

Table 57: Hen Day laying percent

Year	068/69	069/70	070/71	071/72	072/73	073/74	074/75	075/76	076/77	077/78	078/79	079/080
%	48	48.61	53.81	55	54.1	54.8	55	54.4	55.1	54.1	56.2	54.3

Fertility, Hatchability and Mortality:

- Fertility of eggs set in incubators for the FY 079/80 is 86.2 percent which is slightly lower than that of previous years.
- Farm performance on hatchability is satisfactory and has improved upto 85.5% in comparison to 84.6% of the previous years for the eggs set in the incubator.

- Mortality in the farm during brooding (0 to 8 weeks), growing (9 to 20 weeks) and laying (21 weeks onwards) in various age groups in the last fiscal year is 2.2,10.3 and 2% respectively.

DOUBLE TRACK MANAGEMENT SYSTEM (DTMS)

Background :

Double Track Management System (DTMS) was started in the farm in year 061/62 after agreement with MOAD and Rs. 25,00,000/- received as a soft loan from the government was used to run activities under this. According to DTMS karyabidhi the farm management with approval from the Farm Direction Committee can start any extra activity which is complementary to regular farm activities, earn profit and distribute bonus (only 30% of total net profit) among staff members.

The farm under DTMS had initially started Buffalo bull calf fattening and Animal feed production but Fattening of buffalo bull calves was discontinued and Pokhara Model dairy has been started. Thus, there were two activities namely; Animal feed production and Dairy (milk purchase and processing) under DTMS from FY 2071/72.

Activities- Annual Targets and Progress:

Animal Feed Production :

The farm, under DTMS has been producing animal feed since inception of DTMS in 061/62 and has been producing approximately 400 Mt of animal feed. Part of the produced feed (less than 1%) is sold outside after using about 95% in the farm itself. On the year 2079/80, We produced 449000 kg of feed.

Table 58 : Feed Produced & Sold at NLBO, Pokhara During FY 2079/80

S.N.	**Feed Production**	**Unit**	**Qty**	**Remarks**
1	Poultry Feed (Starter)	kg	27500	
2	Poultry Feed (Grower)	kg	19000	
3	Poultry Feed (Breeder)	kg	84500	
4	Feed of Bulls	kg	45050	(450 kg for Buck)
5	Pig Feed	kg	84000	
6	Cattle Feed	kg	163500	
7	Goat Feed	kg	25000	
8	**Total Feed**	**kg**	**449000**	
9	**Total Amount of Sales**	**Rs**	**27663000**	

Feed Quality

We are very sensitive toward the quality of the feed produced in our feed production unit because it is directly related to the production performance of our nucleus herds (animals and birds). Without quality raw materials, we cannot produce quality feed. Following is the acceptable standard of feed ingredients that we have been purchasing in this farm.

Table 59 :Acceptable standard of some feed ingredients to be purchased at National Livestock Breeding Office, Pokhara

S. N.	Feed Ingredients	DM %	CP %	Ca% or g/kg DM	CF% of DM	Phosphorus %	Aflatoxin	Physical Form	Physical/varietal Impurities	Other details
1	Yellow Maize	NLT 87 %	NLT 9 %	-	NMT 2.5%	-	*NMT 50 ppb	Tooth Shaped	*NMT 2%	Spoiled/ Damaged grain <2 %
2	Deoiled Rice Bran (DORB)	NLT 89 %	15 %	NLT 0.7 gm/kgDM	NMT 9 %	NLT 12gm /kgDM	*NMT 50 ppb	Granule /pellet	*NMT 2%	

3	Mustard Cake (Preferable)	NLT 88 %	NLT 34 %	NLT 0.5 gm/kgDM	NMT 12 %	NLT 11 gm/KgDM	*NMT 50 ppb	Ground or partly ground or pieces	*NMT 2%	
	if Rapeseed or Canola Meal (Alternate)	NLT 88 %	NLT 37 %	NLT 0.5 gm/kgDM	NMT 12 %	NLT 11 gm/KgDM	*NMT 50 ppb	Ground or partly ground or pieces	*NMT 2%	
4	Soyabean Meal	NLT 88 %	NLT 47 %(lysine 6.3 % of Protein)	NLT 3 gm/kgDM	NMT 6.5%	NLT 7 gm/KgDM	*NMT 50 ppb	Ground or partly ground	*NMT 2%	Dehulled or ordinary
5	Full fat Soyabean Meal (Soya meal high oil)	NLT 87 %	NLT 36 %	NLT 0.28 %	NMT 5%	NLT 0.66 %	*NMT 50 ppb	whole	*NMT 2%	Dehulled or ordinary
6	Oyster shell/Sippi	NLT 95 %	-	NLT 33% (Made up of Oyster cell of NLT 94% Calcium Carbonate)	-	-	*NMT 50 ppb	Ground	*NMT 2%	*Salmonella = Negative

7	Fish Meal/Jawala	NLT 88 %	NLT 49 % (lysine 7% of Protein)	*NMT 6% or 79 gm/kg DM	-	*NLT 3% or 39 gm/Kg DM	*NMT 50 ppb	Whole or ground or partly ground	*NMT 2%	*Salt by Sodium Chlroide = NMT 4%, Salmonella = Negative
8	Meat Cum Bone Meal (MBM_ High fat)	NLT 95.8 %	NLT 54 %	NLT 101gm/kg DM	-	NLT 48.7 gm/kg DM	*NMT 50 ppb	Ground or partly ground	*NMT 2%	*Salt by Sodium Chlroide = NMT 4%, Salmonella = Negative
	Meat Cum Bone Meal (MBM_ Low fat)	NLT 93.2 %	NLT 62 %	NLT 94gm/kg DM	-	NLT 45.8gm/kg DM	*NMT 50 ppb	Ground or partly ground	*NMT 2%	*Salt by Sodium Chlroide = NMT 4%, Salmonella = Negative
9	Dicalcium Phosphate (DCP)			NLT 22%	-	NLT 16%	-	Ground	*NMT 2%	
10	Limestone	NLT 98 %		NLT 36%	-	0.18 % (Pavl)		Ground	*NMT 2%	
11	Sunflower meal	NLT 93 %	NLT 33 %	NLT 0.37 %	NMT 13%	NLT 1% (pavl 0.33 %)	*NMT 50 ppb	Ground or partly ground or pieces	*NMT 2%	

12	Til meal or Sesame meal	NLT 92.8 %	NLT 44.9 %	NLT 19.7 gm/kg DM	NMT 7.3%	NLT 12.6 gm/kg DM	*NMT 50 ppb	Ground or partly ground or pieces	*NMT 2%	
13	Rice Bran	NLT 90.1 %	NLT 13 %	NLT 0.7 gm/kg DM	NMT 8.6%	NLT 17 gm/kg DM	*NMT 50 ppb	flour	*NMT 2%	
14	Wheat Bran	NLT 90 %	NLT 15 %	NLT 0.14 %	NMT 11%	NLT 1.15 %	*NMT 50 ppb			
15	Calcite grit	NLT 98 %			34%					

Note on Acronyms:

NLT=Not less than
NMT= Not more than
PPb= Parts per billion
NA= Not Applicable
ME=Mechanically Extracted or Expeller type
Pavl= Available phosphorus
SE= Solvent Extracted
*= Very Sensitive (Not Flexible)
Pavl= Available Phosphorus

Pokhara Model Dairy:

Pokhara Model Dairy, a small milk processing facility with capacity to process about 500 liters of milk daily, it was established for training purpose at the farm premises as part of a FAO/TCP/ NEP/3103 (D). The TCP 3103 started in 2064/65 ran nearly for two years and provided initial support to start the dairy including all the equipment and part of the construction expenditure. The TCP also enhanced capacity of stakeholders including farm staff. The dairy started trial production from 2065-8-29 and came in to regular operation from 2065-12-20. The model dairy routinely procures milk from the buffalo unit and sells milk and products after processing. The facility is utilized to train participants whenever there is training program.

Table 60 :Sales of milk and generated revenue during the fiscal year 2022/23

Sales of Milk	Unit	Qty	Rate	Amount	Remarks
Buffalo milk	litres	101921	100	10,192,100	Sold from Model Dairy
Cow milk	litres	49295	70	34,50,650	Sold from Model Dairy
Total				**13766615**	**(Including the Milk Products)**

Double Track Management System (DTMS) - Loan and Funds Generated :

As mentioned earlier, the farm in 2060/61, received Rs. 2500,000/- as loan from the ministry (MOAC) and used that seed money to start DTMS activities. The farm has paid back the loan as per schedule (table 66) and generated different funds (Table 67) as per the provision of the operating procedure *(Karyabidhi)*. In addition, DTMS activities contributed 15% of the profit to revenue and distributed 30% of the profit to all the farm employees as bonus.

Table 61 : DTMS Loan and Repayment

Particulars	Year	Amount	Remaining	Remarks
Loan from MOAC	2060/061	2500,000	2500,000	
Repayment	2061/062	500,000	2000,000	
Repayment	2062/063	500,000	1500,000	
Repayment	2063/064	500,000	1000,000	
Repayment	2064/065	500,000	500,000	
Repayment	2065/066	500,000	Nil	

U. Special Problems of Farm Units:

There are a number of problems that the Nuclues farm units of NLBO, Pokhara has been facing in its smooth running and the most important ones are;

1. Inadequate Budgets for Repair & Maintenance:

Maintenance budget has always been a limitation to all livestock farms and situation in this farm is not different. All roofing of farm buildings made up of CGI sheets, built almost three decades ago need renovation. Similarly, the farm has many infrastructures needing repair but inadequate allocation of annual budgets to do so.

2. Increasing costs of production Inputs:

There has been unexpected increase in wages and prices of production inputs in last few years, but the budget, especially for production inputs, is not increasing in that ratio. This

limitation has compelled farm management to cut back farm operations and decrease the annual production targets.

3. Efficiency of manpower:

Concept of the government farm is not only to produce the required number of animals and birds for farmers, it is also a breeding and research station where the scientific works need to held. Unfortunately, the technicians are neither academically high qualified in the related field nor well trained. It is making much difficult to upgrade the farm scientifically.

V. Biosecurity:

All the major principles of Biosecurity has been strictly followed by the NLBO authority. In short, following three major principles of Biosecurity has been followed in the farm premises.

1) Isolation-

The Farm shed area is located at distance and is not easily accessible to the unnecessary people and other livestock from the surrounding area.

2) Traffic Control

The unnesessary visits by the people, even from the farm staff family members, is discouraged in the farm area. Visits by the farmers of other area, trainees and livestock buyers, suppliers, feed suppliers etc is strictly regulated. The use of gloves, footwears, aprons, footbath and protective spray etc is always mandatory to the visitors.

3) Sanitation

When an infectious and devastating disease occurs in the farms (especially in poultry and swine farms) the infected area is completely sanitized by the ideal and appropriate methods.

7. Technical Session

Effects of green fodder feeding on semen quality of buffalo bulls maintained in National Livestock Breeding Center Pokhara, a review of annual semen production records.

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Abstracts

National Livestock Breeding Centre reviewed the annual semen production record (fiscal year 2071/72) of 8 Murrah buffalo bulls maintained in the center. The objective of the present study was to find out the relationship between green fodders feeding on semen production performance of Murrah buffalo bulls. All the 8 bulls were maintained under naturally prevailing climatic condition at NLBC and were housed individually in pen with open space, having sufficient cross ventilation. All bulls were fed with good quality seasonal fodder at the rate of 25-30 kg and 2-3 kg concentrate formulated in Pokhara Livestock Development farm. Regular supply of sufficient green fodder is not only important for milk production but also for quality semen production for cattle and buffalo bull. Year round Fodder production is prerequisite for quality frozen semen production. National Livestock Breeding Center manages the provision of year round supply of green fodder for the bulls. The parameters of study were average semen volume, fresh semen motility, sperm concentration, dilution rate and post freezing motility. The semen production data was compiled and analyzed for individual performance of bulls for winter, summer and rainy season based on fodder availability in the season. The study shows that the average semen volume per ejaculation per bull was 4.2±0.06, semen concentration was 1295.5±16.88 million/ml, fresh semen motility was 74.59±0.14 % and post freezing motility was 48.2±0.27%. There was a significant difference between different fodder feeding regime ($p<0.001$) level in volume, concentration and post freezing motility of the semen. Hence, fodder can have significant effect on quality of the semen.

Key words: Buffalo bulls, NLBC, semen quality, Fodder availability

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INTRODUCTION

Regular supply of sufficient green fodder is not only important for milk production but also for quality semen production for cattle and buffalo bull. Year round Fodder production is prerequisite for quality frozen semen production. National Livestock Breeding Center manages

the provision of year round supply of green fodder for the bulls. However, there is short supply of green fodder between two seasons, although gap between two seasons is about 4-5 weeks. Semen quality is affected by breed, reproductive health status of bulls, technical skills, age, and genetic constitution of bull. Moreover, quality of semen is affected by nutritional availability. The effect of nutrition on bull fertility before and after puberty is manipulated via the effect of the dietary constituents on the hypothalamic-pituitary axis, which may directly affect testicular development (Brown, 1984).

Malnutrition, particularly low energy intake in males, can also impair spermatogenesis. Buffalo bulls are comparatively more susceptible to heat stress due to their poor heat regulation mechanism than the females (Akhtar, 1988) and at the same time, availability of fodder for nutrition is also affected in different seasons which in turn have effect on quality of semen they produce. Adverse effects of high ambient temperature during summer is on the testicular size, libido and semen quality have been reported in sheep and goats (Ahmad, 1994), cattle (Soderquist et al., l992) and buffaloes (Nazir, 1988; Barnabe et al., 1992). Semen quality is affected by breed (Mukhopadhyay et al. 2010); reproductive health status of bulls, technical skills, age (Mandal et al. 2010; Ahmad et al. 2011), and genetic constitution of bull (Koivisto et al. 2009) over a long period may not be consistent as it is not under a single managemental hand.

OBJECTIVE OF THE STUDY:

- To find out the relationship between green fodder feeding on semen production performance of Murrah buffalo bulls.
- To study the different species of fodder feeding on semen quality.
- To find the seasonal effect on semen quality.

MATERIALS AND METHODS

Annual semen production records of eight buffalo bulls maintained in National Livestock Breeding Centre in fiscal year 2071/2072 was reviewed. Altogether 608 ejaculations were studied. Five to seven years old buffalo bulls and having body weight of 450 to 550 kg were used to collect semen twice a week using artificial vagina. Two ejaculations were collected at an interval of 30 minutes. Green fodder of 25-30 kg/bull/day and Paddy straw depending upon DM content in green on an average of 3 to 5 kg/bull/day was given to each bull. In addition to this, concentrate of 3 to 4 kg/bull/day formulated in Pokhara Livestock farm was given along with adlibitum supply of fresh water.

Fresh mature Teosinte with concentrate was given to bulls during the month of July to October. Green oat with rice straw and concentrate was given during the month of November to March. Green maize with rice straw and concentrate was given during the month of April to June. The parameters for study was fresh semen volume, sperm concentration, sperm motility, final volume and post freezing motility. The fresh semen volume was measured by graduated semen collection tube used for collection. The sperm concentration was measured using photometer. The sperm motility was measured using Computer Assisted Semen Analyzer. All the concerned data was tabulated and statistical analysis was carried out using Harvey (1990) software.

RESULTS AND DISCUSSION

The result showed that the average semen volume when Teosinte, oat, Maize /Napier was fed was 4.66±0.11 ml, 3.79±0.11ml, 4.17±0.13ml respectively. The overall mean was 4.2±0.06. There was a significant difference between the volume of ejaculates during different feeding regime. The volume was recorded highest during Teosinte feeding followed by maize/ napier and oat.

The average sperm concentration in fresh semen when Teosinte, oat, Maize /Napier was fed was 1363±28.57, 1290.9±26.94, 1232.6±31.99 million per ml respectively. The overall mean was 1295.5±16.88 million per ml. There was a significant difference between the volume of ejaculates during different feeding regime. The concentration was recorded highest during Teosinte feeding followed by oat and maize/ napier.

Effect of seasonal feeding on semen volume (ml) and concentration ($x10^6$) of Murrah Bull at NLBC, Pokhara

Factors	Volume (LS±SE)	Concentration LS±SE)	No of Obs.
Overall mean	4.2±0.06	1295.5±16.88	608
Seasonal Feeding	***	***	
Teosinte	$4.66±0.11^{a}$	$1363.1±28.57^{a}$	208
Oat	$3.79±0.10^{c}$	$1290.9±26.94^{ab}$	234
Maize Napier	$4.17±0.13^{b}$	$1232.6±31.99^{b}$	166
CV	38.55	31.71	

Note: LS mean: Least square means; SE: Standard errors; No: Number of observations; ***: Significant at 0.1% level (P<0.001); NS: Not Significant; Means, within an effect, with the different superscript are significantly different.

The average Sperm motility in fresh semen in percentage when teosinte, oat, maize /napier was fed was 74.47±0.24, 74.70±0.23, 74.61±0.27 million per ml respectively. The overall mean was 74.59±0.14 in percentage. There was no significant difference between the Sperm motility in fresh semen during different feeding regime.There was significant difference between the final volume of semen after mixing the extender. The final volume of Teosinte feeding regime was highest followed by Maize/napier and oat respectively. This effect might be due to the difference in the volume and concentration per ml of the semen. There was also significant difference between the post freezing motility between different fodder feeding regime, the highest motility in the oat followed by maize/napier and Teosinte respectively. The average post freezing motility was 47.18±0.46, 49.16±0.44, 48.34±0.52 percent respectively in Teosinte, oat and maize/napier feeding regime. The overall post freezing motility of buffalo bull semen was 48.2±0.27 percent.

Effect of seasonal feeding on semen motility (%), final volume (ml) and Motility PF (%) of Murrah Bull at NLBC, Pokhara

Factors	%Motility (LS±SE)	Final Volume (LS±SE)	%Motility PF (LS±SE)	No. of Obs.
Overall mean	74.59±0.14	57.9±1.79	48.2±0.27	608
Seasonal Feeding	NS	***	***	
Teosinte	74.47±0.24	70.33 ± 3.03^{a}	47.18 ± 0.46^{b}	208
Oat	74.70±0.23	50.31 ± 2.86^{b}	49.16 ± 0.44^{a}	234
Maize Napier	74.61±0.27	53.06 ± 3.39^{b}	48.34 ± 0.52^{ab}	166
CV	4.76	75.56	13.92	

Note: LS mean: Least square means; SE: Standard errors; No: Number of observations; ***: Significant at 0.1% level (P<0.001); NS: Not Significant; Means, within an effect, with the different superscript are significantly different.

CONCLUSION:

The green fodder has significant effect on the semen quality as far as volume, concentration, post freezing motility is concerned. The stages of fodder maturity, ambient temperature, age of the bull, weather, bull management etc. might play a vital role in determining semen quality which should be further studied.

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APPENDICES

Appendix 1: Proposed Standard Operating Procedures Followed in Nepal for Performing Artificial Insemination

GENERAL PROCEDURES:

1. Keep the premises of the AI Centre clean and maintain all equipment and material properly along with properly tagged canisters with complete description of semen.
2. Always respond to calls made by the farmers. In case there is likelihood of any delay, inform the farmer about expected time of visit.
3. Keep the A.I. kit clean and before leaving the AI centre, check that the A.I. kit has the following items:
    - Scissors
    - Thermometer
    - Thawing Tray
    - Forceps
    - Singly packed sheaths
    - AI Gun with container
    - Plastic gloves
    - Clean towel
    - Thermos-flask with hot water
    - Apron
    - 1.5 / 2 liter Refree with desired semen(White- Murrah, green- Jursey, Pink- H F and blue - buck)
4. Be at the centre on the scheduled day and time of semen and liquid nitrogen delivery.
5. Always keep the container with proper quantity of liquid nitrogen.

INSEMINATION TECHNIQUE:

1. After reaching farmer's place, first identify cow/buffalo and check past breeding records and history.
2. Examine the animal externally and ascertain that animal is in heat. The best sign of heat is clear, transparent, viscous and ropy vaginal discharge.
3. Wash hands.
4. Proceed with preparation of gun only after per rectal examination of genitalia.

5. Have plastic gloves, sheath, gun, scissors, forceps, tissue paper, and clean towel ready before thawing semen.
6. Pour hot water from flask in the thawing tray and adjust temperature of water in the tray to 37 degree centigrade by adding cold or hot water.
7. Remove semen from the refree with forceps and not with hands. Before holding the straw by the forceps, cool its tips for few seconds. While taking out, raise the canister just high enough – not above the frost line. Remove the straw within 10 seconds.
8. Shake straw to remove excess nitrogen and quickly plunge it into thawing tray containing warm water at 37 degree centigrade for 40-45 seconds in the horizontal position or otherwise cotton plug mat blow off.
9. Ensure that insemination gun and sheath also have temperature around 37 degree centigrade and not extremely hot or cold.
10. Take out straw from tray and wipe the straw with clean towel. After thawing A.I. should be performed as early as possible.
11. Before loading the straw in the gun, ascertain that air space in the straw is at the laboratory seal end.
12. Load the straw into the gun and make a clean cut at a right angle with a straight and sharp scissors just below the laboratory seal.
13. Take out the sheath by holding bottom of the sheath corner of the sheath packet and place the sheath on the gun and secure the sheath firmly with o-ring lock.
14. Wear shoulder length plastic glove, preferably on left hand and hold the gun with right hand.
15. Ask farmer to restrain the animal and hold the tail properly. Speak to the animal and make her calm down.
16. Lubricate the gloves with liquid paraffin or any other suitable lubricant before proceeding to rectum.
17. Gently put the gloved hand into the rectum by forming a cone with fingers.
18. Clean the rectum by removing the fecal material without ballooning.
19. Clean vulva with water and wipe with tissue paper.
20. Ask farmer to help spread the vulva.
21. Never allow gun's tip to touch external coat or anus/ vulva of the animal.
22. Insert insemination gun at approximately 30 degree angle till the gun reaches the fornix vagina to avoid entry of gun into the urethral opening/ urinary bladder.
23. Hold the cervix firmly through rectum and slightly stretch it forward to unfold the vaginal folds.

24. Gently and smoothly pass the gun through the vagina to the opening of the cervical canal.
25. Hold the external os of the cervix ahead of the gun's tip and negotiate vaginal folds and cervical rings to pass the gun through the cervix till the gun's tip reaches at internal os.
26. Feel the tip of the gun at internal os by gently moving the gun tip forward to ensure that the gun is in correct place (just at the internal os). Be certain the gun tip is not caught in a thin area between cervical rings or vaginal folds.
27. If the animal moves, STOP. Wait till the movement stops.
28. Hold the shoulder of the gun between your ring and middle fingers and push the gun piston with your thumb slowly (5 seconds) to deposit the semen just outside the internal os to allow semen to drain into the body of uterus. Gently remove the gun and check for abnormal discharge and a complete semen deposit.
29. Recheck semen ID – bull and batch number.
30. Properly dispose off the sheath, gloves and tissue papers. Clean gun if needed.
31. Record breeding information in the specified A.I. cow/ A.I. buffalo register provided by NLBC.
32. Blood on the gun tip and on the gloves indicate that too much force was used to pass the gun – be gentle and patient with the animal.
33. Ask farmer to release the animal and let her calm down.
34. Provide the A.I. fee receipt to the farmers.

Post Insemination Advice to Farmer

1. Ask farmer to keep the animal under observation for next 12-24 hrs.
2. Inform the farmer to save the animal from scrub bulls during the remaining part of present heat.
3. If signs of heat persist even after 18-24 hrs. Call for repeat AI, otherwise observe for heat symptoms after 18-21 days and also after 36-42 days.
4. If animal does not repeat heat at 18-21 days intervals for two consecutive times, call Inseminator for pregnancy diagnosis after 3 months from the date of insemination.

Post insemination follow-up by the Inseminators

1. Follow each and every animal inseminated after around 21 days to find out whether it has repeated.
2. Follow each and every animal inseminated for pregnancy diagnosis after 3 months and record the date and result of pregnancy diagnosis in the register/ format provided by NLBC.

3. Send it to DLSO/NLBC on a monthly basis in the format provided by NLBC.
4. Follow each and every pregnant animal and record calving detail of the animals inseminated in the register/ format provided by NLBC.
5. Maintain all records related to artificial insemination, pregnancy diagnosis, and calving and money transaction.
6. Advise farmers on proper heat detection, feeding, management and health care of animals.

SEMEN HANDLING

1. Keep the liquid Nitrogen container in a location that allows seeing into the neck tube of the container, and ease in withdrawing & replenishment of semen and liquid nitrogen. The surrounding should be well ventilated, dry and dust free.
2. Clean AI gun, scissors and other accessories whenever they get soiled or at least once a week with hot water and air dry them. Sanitize the AI gun and the scissor with Isopropyl alcohol after drying. The AI Gun piston and the scissors should be wiped clean with water after each insemination. Surgical spirit and soaps are lethal to semen, hence should not be used to clean equipments.
3. Maintain the liquid nitrogen level above the straw level in 1.5/2/ 3 liters capacity containers.
4. Measure the liquid nitrogen level of 30 liters containers weekly with the help of measuring scale provided by the NLBC. Maintain the record of measurements to monitor its evaporation rate.
5. Carry the required semen doses in the liquid nitrogen container to farmer's door step. Never carry semen straws in pocket/ thermos-flask / polythene bags filled with water/ice etc.
6. Maintain an accurate semen inventory to lessen the risk of semen exposure.
7. Always attach the paper tag provided with each goblet to the requisite canister of the container to identify the type of semen in each canister.

Appendix 2

Livestock Species & Breeds Maintained in the Shed for semen production until the end of the Fiscal year 2075.76

S.N.	Livestock Type	Scientific name	Chromosome number(2N)	Breeds	No of animals
1	Domestic Water Buffalo(Riverian) Bull	Bubalus bubalis	50	Murrah	16
2	Humpless European Bull	Bos taurus	60	Holstein	8
3	Humpless European Bull	Bos taurus	60	Jersey	13
4	Goat	Capra hircus	60	Boer	8

Appendix 3: Staff Quarters facilities:

SN		Number	Area sqm	Year of construction	Cost Rs. 000
1	B-Grade quarter	1	103	2040/41	146
2	C-Grade qtr (Guest House)	1	95.8	2026/27	70
3	C-Grade quarters	3	353	2037/38	344
4	C-Grade twin quarter	1	92	2026/27	65
5	D-Grade twin quarters	2	148	2037/38	152
6	D-Grade twin quarters	3	221	2040/41	282
7	E-Grade twin quarters	5	266	2037/38	545
8	F-Grade quarter.	1	30.8	2041/42	60
9	Workers quarter (1 family)	1	24.6	2032/33	50
10	Workers quarter (2 families)	1	121	2020/21	30
11	Workers quarter (4 families)	1	95.8	2030/31	45
12	Workers quarter (7 families)	1	205	2048/49	600
13	Workers quarter (8 families)	1	191	2030/31	90
14	Former NLBC Qtr	5	-	Different	NA
	Total	22			2,479

Appendix 4 : The list of vehicles and office equipment :

S.N.	Description	Number	Capacity	Date purchase	Cost in thousand
1	Bicycle	6			
2	Pickup (Ford,Scorpio,Hylux)	3	Double cab	2050/51	769
3	Motorcycle	12	100cc/125cc	Diff	40
4	Trucks	2	Eicher	2075.76	35
	Office Equipments:				
1	Desktop P1 100 mhz	1	100 Mhz	2053/54	80
2	Desktop P1 233 mhz	1	233 mhz	2050/51	105
3	Desktop P4	1	1.66 ghz	2060/61	80
4	Desktop P4	6	Misc	Misc	80
5	Laser Printer HP 1100	1		2055/56	34
6	Laser Printer HP 1200	1		2060/61	25
7	Overhead Projector	3		Diff	75
8	Photocopier	3		2060/61	
9	Slide Projector	1		2040/41	
10	Digital Camera (Sony & other)	2		Diff	25
11	Still camera (Samsung & other)	2		2060/61	7.5
12	Desktop computer Dell	1	Set	2068/69	50
13	Multimedia	1	Set	2059/70	50
14	Laptop (Misc)	6	Misc	Misc	75
15	**Total**				**1,645**

Appendix 5: Buildings and Sheds:

SN	Description	Number	Area sq m	Year of construction	Cost Rs 000
1	Boar Shed cum feed store	1	167	2038/39	123
2	Buffalo shed (plot# 8)	1	435	2040/41	440
3	Bull Shed	1	145	2026/27	
4	Bunker I horizontal silos	2	1600 mt	2035/36	95
5	Calf Shed	1	472	2040/41	338
6	Double row Buffalo shed	1	472	2030/31	271
7	Electrical Chaff cutter shed	1	144	2037/38	59
8	Farrowing shed	1	392	2040/41	504
9	Feed milling & storage	1	77	2028/29	
10	Fuel store & cafeteria	1	122.2	2030/32	
11	Garage cum workshop	1	1115	2040/41	495
12	Generator house	1	54	2040/41	61
13	Growers house	1	577	2040/41	645
14	Hatchery building	1	110	2037/38	121
15	Heifer shed (loose stall)	1	1273	2037/38	125
16	Layer house	1	312	2040/41	306
17	Layer house	1	337	2041/42	472
18	Manure platform	1	1054	2038/39	
19	Nursery shed	1	285	2036/37	
20	Office building	1	600	2040/41	662
21	Open pig shed	1	476	2034/35	100
22	Poultry Brooding house	1	253	2030/31	100
23	Poultry Sales Counter, office	1	80	2057/58	250
24	Scrap store	1	180	2026/27	
25	Seed & fertilizer store	1	207	2029/30	
26	Sheep shed	1	211	2026/27	
27	Sheep sheds	2	422	2030/31	
28	Single row shed (dry buffalo)	1	228	2037/38	163
29	Single row shed (milch buffalo)	1	337	2026/27	
30	Store (Raw materials)	1	72	2026/27	
31	Weighing yard for buffaloes	1	157	2040/41	42
32	Working yard for sheep	1	650	2030/31	
33	Piggery Change room	1		2064/65	35
34	Dormitory Building	3		2068-75	4230

35	Communication Certer	1	3000	2075/76	8000
36	Canteen	1	30	2064/75	2000
	Total	80			11831

Appendix 6 : Farm Machinery and Equipment:

S.N.	Description	Number	Capacity	Date purchase	Cost in 000	
1	Air compressor	1		2051/52	NRs	17.3
2a	Chaff cutter, HIMCo	1		2037/38	NRs	
2b	Indian Chaff cutter	2		207071	NRs	.....
3	Dayal Hatcher	1	9,000 eggs	2037/38	NRs	40
4	Dayal Incubators	2	13,500"	2037/38	NRs	105.8
5	Dial balance	1	100 Kg	2051/52		
6	Digital Balance (0.00)	1		2060/61		
7	Egg candling table	2		2037/38	NRs	0.96
8	Electric Debeakers	3			NRs	6.3
9	Feed mixing plant	1		2040/41	NRs	37.2
10	Forage Harvester, Jaguvar	2		2049/50		
11	Harrow Disk type	1		2033/34		
12	Harrow Tooth type	1		2033/34	DM	2.1
13	Harrow Disk Type	1	RLTC			
14	Heat detector for cattle	1		2049/50		
15	Hot air Oven	1		2060/61		
16	Kirloskar generator	1	60KVA	2037/38	NRs	153.2
17	Kirloskar generator	1	25KVA	2048/49		117
18	Leveler	1		2033/34	DM	0.1
19	Microscope Binocular	1		2051/52	NRs	70
20	Microscope, Monocular	1		2049/50	NRs	16.3
21	Moldboard Ploughs	2	3 shares	2033/34	DM	10.14
22	Pregnancy detectors	1		2049/50		
23	Refrigerator Hitachi	1	210 litres	2051/52	US$	590
24	Refrigerator LG	1	200 litres	2060/61		
25	Refrigerator Samsung	1	150 litres	2049/50	NRs	25.9
26	Tractor Belarus 12	1	65 HP	2048/49	NRs	408.3
27	Tractor Belarus 13		65 HP	2048/49	NRs	408.3
28	Tractor Russian Belarus	1	65HP	2042/43	NRs	185.7
29	Tractors Schluter 5 & 8	2	85HP	2033/34	NRs	128.4
30	Trailer	1	2049/50	NRs	21	
31	Trailers	2	2049/50	NRs	170	
32	Trailers	3	2037/38			
33	Transformer	100 KVA	2037/38			
34	Weighing scale buffaloes	1	1000 kg	2035/36	NRs	
35	Weighing scale for pigs	1	500Kg	2035/36		
36	Weighing scale for sheep	1	300Kg	2035/36		
37	Welding Machine	1	2037/38			

S.N.	Description	Number	Capacity	Date purchase	Cost in 000	
38	Tractor (Sonalika) 1243 (with front loader)	1	60HP	2065/66	NRs	1890
39	Tractor (Indofarrn)1207	1	60HP	2065/66	NRs	959
40	Jet Pressure (Karcher)	2	2065/66	NRs	120	
41	Welding Machine Dry	1	RLTC	2062/63		
42	Hatcher1: and incubator set	1	6000/18000	2068/69	1200	
43	Tractor 4wd,	1	75HP	2069/70	NRS	2000
44	Grass/forage Harvestor	2		2075/76	NRS	1600
45	Hydroponic Chamber	1		-	NRS	4000

Appendix 7

Livestock Species & Breeds Maintained in the Nucleus Farm

S.N.	Livestock Type	Scientific name	Chromosome number(2N)	Breeds
1	Domestic Water Buffalo(Riverian)	Bubalus bubalis	50	Murrah
2	Goat	Capra hircus	60	Boer
3	Sheep	Ovis aries	54	Kage
4	Pig	Sus domesticus	60	Landrace, Yorkshire, Duroc & their Crosses
5	Poultry	Gallus domesticus	78	New Hempshire & Black Australop
6	Jersey Cattle	Bos Taurus	60	Jersey
7	Holstein Cattle	Bos Taurus	60	Holstein

१०.साँढेको नामः **PJ- 83 (GALLANTRY-ET)**

जातः जर्सी

जन्म मितिः २०७७/११/२१

स्रोतः ST Genetics, USA

साँढेको बाउको ID: 551JE1762

साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ९७४९ केजी

साँढेको आमाको ID: 12092

साँढेको आमाको दूध उत्पादन प्रति वेतः ९६०५ केजी

११.साँढेको नामः **PJ- 84 (CALLIBAN)**

जातः जर्सी

जन्म मितिः २०७७/०८/०२

स्रोतः ST Genetics, USA

साँढेको बाउको ID: 7JE1787

साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ९४७१ केजी

साँढेको आमाको ID: 10928

साँढेको आमाको दूध उत्पादन प्रति वेतः ९४२० केजी

१२.साँढेको नामः **PJ- 85 (RAMJI)**

जातः जर्सी

जन्म मितिः २०७८/०५/१८

स्रोतःDCIP/PPRS, लालीगुराँस डेरी फार्म, चितवन

साँढेको बाउको ID: 7JE1477

साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ८६७५ केजी

साँढेको आमाको ID: 25174/865

साँढेको आमाको दूध उत्पादन प्रति वेतः ४४०० केजी

१३.साँढेको नामः **PJ- 86(DEVI)**

जातः जर्सी

जन्म मितिः २०७७/१२/२१

स्रोतः DCIP/PPRS Selection, Kavre

साँढेको बाउको ID: ET-06 (APAR)

साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०००० केजी

साँढेको आमाको ID: DK1326

साँढेको आमाको दूध उत्पादन प्रति वेतः ४८०० केजी

१४.साँढेको नामः **PJ- 87 (KHUMAL)**

जातः जर्सी

जन्म मितिः २०७८/०२/०३

स्रोतः NARC, Khumaltar

साँढेको बाउको ID: ET-06 (APAR)

साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०००० केजी

साँढेको आमाको ID: 5587

साँढेको आमाको दूध उत्पादन प्रति वेतः ४८०० केजी

१५.साँढेको नामः **ET-06 (APAR)**

जातः जर्सी

जन्म मितिः २०७४/०१/०६

स्रोतः NARC, Khumaltar

साँढेको बाउको ID: 14DTE835

साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ९००० केजी

साँढेको आमाको ID: 1680 Surrogate

साँढेको आमाको दूध उत्पादन प्रति वेतः १०००० केजी

नेपाल सरकार

कृषि तथा पशुपन्छी विकास मन्त्रालय

पशु सेवा विभाग

राष्ट्रिय पशु प्रजनन् कार्यालय, पोखरा

"व्यावसायिक पशुपालनको आधार, पशुपन्छीको नश्ल सुधार"

जर्सी साँढेहरुको विवरण

लामपाटन, पोखरा, कास्की

फोन नं.: ०६१-५०५३८५

E-mail : nlbc.pokhara@gmail.com

Website : www.nlbo.gov.np

आ.व. २०८०/८१

जर्सी साँढेहरू

१. साँढेको नामः **PJ- 71 (KAPOOR)**

जातः जर्सी
जन्म मितिः २०७०/०४/१३
स्रोतः DCIP/PPRS, जिरी फार्म, दोलखा
साँढेको बाउको ID: 305054USA
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ८००० केजी
साँढेको आमाको ID: 2642
साँढेको आमाको दूध उत्पादन प्रति वेतः ३३६९.७५ केजी

२. साँढेको नामः **PJ- 73 (NARE)**

जातः जर्सी
जन्म मितिः २०७१/०७/०३
स्रोतः DCIP/PPRS, कामधेनु फार्म गोरखा
साँढेको बाउको ID: 7JE859USA
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ८५०० केजी
साँढेको आमाको ID: 11107
साँढेको आमाको दूध उत्पादन प्रति वेतः ४६९२ केजी

३. साँढेको नामः **PJ- 75 (NAKUL)**

जातः जर्सी
जन्म मितिः २०७१/१२/०२
स्रोतः DCIP/PPRS, जिरी फार्म, दोलखा
साँढेको बाउको ID: 7JE859USA
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ८५०० केजी
साँढेको आमाको ID: 2621
साँढेको आमाको दूध उत्पादन प्रति वेतः ४३७७.२ केजी

४. साँढेको नामः **PJ- 76 (HARKA)**

जातः जर्सी
जन्म मितिः २०७३/१०/०६
स्रोतः DCIP/PPRS, अन्नपूर्ण दु.उ.स.स., गीतानगर, चितवन
साँढेको बाउको ID: 305054CFp181
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७५०० केजी
साँढेको आमाको ID: 1832
साँढेको आमाको दूध उत्पादन प्रति वेतः ४२०० केजी

५. साँढेको नामः **PJ- 78 (AVIMAT)**

जातः जर्सी
जन्म मितिः २०७४/११/२३
स्रोतः अर्घाखाँची
साँढेको बाउको ID: सेक्स्ड सिमेन
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०००० केजी
साँढेको आमाको ID: उपलब्ध नभएको
साँढेको आमाको दूध उत्पादन प्रति वेतः ४००० केजी

६. साँढेको नामः **PJ- 79 (PRAHLAD)**

जातः जर्सी
जन्म मितिः २०७६/०४/१०
स्रोतः DCIP/PPRS, सेतिदेवी दू.उ.स., काभ्रे
साँढेको बाउको ID: VJLink303327
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७०४३ केजी
साँढेको आमाको ID: C0935
साँढेको आमाको दूध उत्पादन प्रति वेतः ४५०० केजी

७. साँढेको नामः **PJ- 80 (DAMU)**

जातः जर्सी
जन्म मितिः २०७६/०६/२२
स्रोतः जिरी फार्म, दोलखा
साँढेको बाउको ID: सेक्स्ड सिमेन
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७५०० केजी
साँढेको आमाको ID: 2190
साँढेको आमाको दूध उत्पादन प्रति वेतः ४५०० केजी

८. साँढेको नामः **PJ- 81 (JIRE)**

जातः जर्सी
जन्म मितिः २०७६/०५/२५
स्रोतः जिरी फार्म, दोलखा
साँढेको बाउको ID: सेक्स्ड सिमेन
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७५०० केजी
साँढेको आमाको ID: 22234
साँढेको आमाको दूध उत्पादन प्रति वेतः ४००० केजी

९. साँढेको नामः **PJ- 82 (PRADIP)**

जातः जर्सी
जन्म मितिः २०७७/०७/१७
स्रोतः DCIP/PPRS, लालीगुराँस डेरी फार्म, चितवन
साँढेको बाउको ID: 305054USA
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ८००० केजी
साँढेको आमाको ID: 22320
साँढेको आमाको दूध उत्पादन प्रति वेतः ४१०० केजी

१०.साँढेको नामः **ET-07 (DOLLAR)**

जातः होल्स्टीन
जन्म मितिः २०७४-०२-०७
स्रोतः कामधेनु फार्म, गोरखा
साँढेको बाउको ID: HOC8956379
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०००० केजी
साँढेको आमाको ID: CHORUS
साँढेको आमाको दूध उत्पादन प्रति वेतः ११००० केजी

११.साँढेको नामः **PHF-38 (SHERU)**

जातः होल्स्टीन
जन्म मितिः २०७८-०३-२०
स्रोतः NLBO, Pokhara
साँढेको बाउको ID: 14H07600
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७६०० केजी
साँढेको आमाको ID: 2510
साँढेको आमाको दूध उत्पादन प्रति वेतः ६००० केजी

१२.साँढेको नामः **PHF-39 (DHAKA)**

जातः होल्स्टीन
जन्म मितिः २०७६-१०-०४
स्रोतःDCIP/PPRS, थाम्पाफाँट दू.उ.स.स., तनहुँ
साँढेको बाउको ID: 14HO7760
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ८७४३ केजी
साँढेको आमाको ID: 13297
साँढेको आमाको दूध उत्पादन प्रति वेतः ४८७० केजी

१३.साँढेको नामः **PHF-40 (SUJU)**

जातः होल्स्टीन
जन्म मितिः २०७८-०३-२६
स्रोतः NLBO, Pokhara
साँढेको बाउको ID: 14HO7660
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७००० केजी
साँढेको आमाको ID: 2507
साँढेको आमाको दूध उत्पादन प्रति वेतः ४६०० केजी

राष्ट्रिय पशु प्रजनन् कार्यालय, पोखराद्वारा भ्रुण प्रत्यारोपण (Embryo Transfer) गरी जन्मेका बाच्छाहरू

१. साँढेको नामः **ET-08**

जातः होल्स्टीन
जन्म मितिः २०७९-०१-२०
स्रोतः DCIP/PPRS,
लालीगुराँस डेरी फार्म, चितवन
साँढेको बाउको ID: ES07HO71440464 Bugle
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०५३० केजी
साँढेको आमाको ID: HO30069728161H11314 MOGUL
साँढेको आमाको दूध उत्पादन प्रति वेतः १२५५७ केजी

२. साँढेको नामः **ET-09**

जातः होल्स्टीन
जन्म मितिः २०७९-०६-३०
स्रोतः DCIP/PPRS,
लालीगुराँस डेरी फार्म, चितवन
साँढेको बाउको ID: 3129037603 Superhero 16AU02
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०८५० केजी
साँढेको आमाको ID: HO312861555 Paprika
साँढेको आमाको दूध उत्पादन प्रति वेतः १३२२० केजी

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पशु सेवा विभाग

राष्ट्रिय पशु प्रजनन् कार्यालय, पोखरा

"व्यावसायिक पशुपालनको आधार, पशुपन्छीको नश्ल सुधार"

होल्स्टीन साँढेहरुको विवरण

लामपाटन, पोखरा, कास्की
फोन नं.: ०६१-५०५३८५
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Website : www.nlbo.gov.np
आ.व. २०८०/८१

होल्स्टीन साँढेहरू

१. साँढेको नामः **PHF-28 (RAJEEV)**

जातः होल्स्टीन
जन्म मितिः २०७४-१०-०१
स्रोतः DCIP/PPRS, कामधेनु फार्म गोरखा
साँढेको बाउको ID: 14HO7660
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७००० केजी
साँढेको आमाको ID: 3060
साँढेको आमाको दूध उत्पादन प्रति वेतः ५४३० केजी

२. साँढेको नामः **PHF-30 (GERRARD)**

जातः होल्स्टीन
जन्म मितिः २०७६-०२-०६
स्रोतःDCIP/PPRS, लालीगुराँस डेरी फार्म, चितवन
साँढेको बाउको ID: 00200H00185
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ९००० केजी
साँढेको आमाको ID: 26025
साँढेको आमाको दूध उत्पादन प्रति वेतः ६०५० केजी

३. साँढेको नामः **PHF-31 (MAHESH)**

जातः होल्स्टीन
जन्म मितिः २०७६-०६-२७
स्रोतः DCIP/PPRS, कामधेनु फार्म गोरखा
साँढेको बाउको ID: 7H013279
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०६६० केजी
साँढेको आमाको ID: 13665
साँढेको आमाको दूध उत्पादन प्रति वेतः ४८०० केजी

४. साँढेको नामः **PHF-32 (MAHADEV)**

जातः होल्स्टीन
जन्म मितिः २०७६-०५-०६
स्रोतः DCIP/PPRS, कामधेनु फार्म गोरखा
साँढेको बाउको ID: H07090
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १०८८५ केजी
साँढेको आमाको ID: 9645
साँढेको आमाको दूध उत्पादन प्रति वेतः ४६२० केजी

५. साँढेको नामः **PHF-33 (MAGEL-ET)**

जातः होल्स्टीन
जन्म मितिः २०७७-०८-२९
स्रोतः ST Genetics, USA
साँढेको बाउको ID: 7H015197
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः १३१५० केजी
साँढेको आमाको ID: H0840003204071939
साँढेको आमाको दूध उत्पादन प्रति वेतः १३०६५ केजी

६. साँढेको नामः **PHF-34 (BHOJ)**

जातः होल्स्टीन
जन्म मितिः २०७७-१०-१९
स्रोतः DCIP/PPRS, उमादेवी पशु विकास फार्म, रुपन्देही
साँढेको बाउको ID: ABS, Brute 28H018391
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ११३५३ केजी
साँढेको आमाको ID: 23270
साँढेको आमाको दूध उत्पादन प्रति वेतः ४७०० केजी

७. साँढेको नामः **PHF-35 (RAJAN)**

जातः होल्स्टीन
जन्म मितिः २०७७-११-०५
स्रोतः NARC Khumaltar
साँढेको बाउको ID: 14H07770
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ९००० केजी
साँढेको आमाको ID: 23455
साँढेको आमाको दूध उत्पादन प्रति वेतः ५५०० केजी

८. साँढेको नामः **PHF-36 (PRAKASH)**

जातः होल्स्टीन
जन्म मितिः २०७८-०२-१६
स्रोतः NLBO, Pokhara
साँढेको बाउको ID: 14HO7660
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ७००० केजी
साँढेको आमाको ID: 2507
साँढेको आमाको दूध उत्पादन प्रति वेतः ४६०० केजी

९. साँढेको नामः **PHF-37 (ABHI)**

जातः होल्स्टीन
जन्म मितिः २०७७-११-२१
स्रोतः NARC, Rampur
साँढेको बाउको ID: 14HO7593
साँढेको बाउको आमाको दूध उत्पादन प्रति वेतः ९५३१ केजी
साँढेको आमाको ID: 12596
साँढेको आमाको दूध उत्पादन प्रति वेतः ५३७० केजी

१०.राँगाको नामः **PM-111 (SANDEEP)**

जातः मुर्रा
जन्म मितिः २०७६-०४-१४
स्रोतः NLBO, Pokhara
राँगाको बाउको ID: 5647
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ३१०० केजी
राँगाको आमाको ID: 280
राँगाको आमाको दूध उत्पादन प्रति वेतः २९०० केजी

११.राँगाको नामः **PM-112 (PARAS)**

जातः मुर्रा
जन्म मितिः २०७६-०५-२३
स्रोतः NLBO, Pokhara
राँगाको बाउको ID: 5647
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ३७५० केजी
राँगाको आमाको ID: N174
राँगाको आमाको दूध उत्पादन प्रति वेतः ३००० केजी

१२.राँगाको नामः **PM-113 (SHAKTI)**

जातः मुर्रा
जन्म मितिः २०७७-०५-२०
स्रोतः शुद्धोधन डेरी फार्म, सियारी, रुपन्देही
राँगाको बाउको ID: PC11622
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ३२०० केजी
राँगाको आमाको ID: D243
राँगाको आमाको दूध उत्पादन प्रति वेतः ३१०० केजी

१३.राँगाको नामः **PM-114 (SANTA)**

जातः मुर्रा
जन्म मितिः २०७६-११-२६
स्रोतः NLBO, Pokhara
राँगाको बाउको ID: 5647
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ३२०० केजी
राँगाको आमाको ID: N336
राँगाको आमाको दूध उत्पादन प्रति वेतः ३१५० केजी

१४.राँगाको नामः **PM-115 (SOM)**

जातः मुर्रा
जन्म मितिः २०७५-१२-११
स्रोतः NLBO, Pokhara
राँगाको बाउको ID: 5647
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ३२०० केजी
राँगाको आमाको ID: N337
राँगाको आमाको दूध उत्पादन प्रति वेतः ३१५० केजी

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मुर्रा राँगाहरुको विवरण

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आ.व. २०८०/८१

मुर्रा राँगाहरू

१. राँगाको नामः **PM-69 (BASANTA)**

जातः मुर्रा
जन्म मितिः २०७०-०७-०३
स्रोतः हरियाणा भारत
राँगाको बाउको ID: HLDB-165
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४२६० केजी
राँगाको आमाको ID: RRP-162
राँगाको आमाको दूध उत्पादन प्रति वेतः ३८६० केजी

२. राँगाको नामः **PM-101 (PRATAP)**

जातः मुर्रा
जन्म मितिः २०७०-०३-०५
स्रोतः हरियाणा भारत
राँगाको बाउको ID: HLBD-205
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४२०० केजी
राँगाको आमाको ID: RRP-168
राँगाको आमाको दूध उत्पादन प्रति वेतः ३९५० केजी

३. राँगाको नामः **PM-102 (BIPU)**

जातः मुर्रा
जन्म मितिः २०७०-०३-२६
स्रोतः हरियाणा भारत
राँगाको बाउको ID: HLDB-261
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४२३० केजी
राँगाको आमाको ID: RRP-82
राँगाको आमाको दूध उत्पादन प्रति वेतः ३८१० केजी

४. राँगाको नामः **PM-103 (SHAMBHU)**

जातः मुर्रा
जन्म मितिः २०७०-०८-११
स्रोतः हरियाणा भारत
राँगाको बाउको ID: HLDB-151
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४१८० केजी
राँगाको आमाको ID: RRP-150
राँगाको आमाको दूध उत्पादन प्रति वेतः ३७४० केजी

५. राँगाको नामः **PM-106 (RISHI)**

जातः मुर्रा
जन्म मितिः २०७०-१०-११
स्रोतः हरियाणा भारत
राँगाको बाउको ID: HLDB-221
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४२५० केजी
राँगाको आमाको ID: RRP-75
राँगाको आमाको दूध उत्पादन प्रति वेतः ३८९५ केजी

६. राँगाको नामः **PM-107 (PREM)**

जातः मुर्रा
जन्म मितिः २०७४-०१-१६
स्रोतः NLBO, Pokhara
राँगाको बाउको ID: 6299
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ३८०० केजी
राँगाको आमाको ID: N214
राँगाको आमाको दूध उत्पादन प्रति वेतः ३१०० केजी

७. राँगाको नामः **PM-108 (THANESHWAR)**

जातः मुर्रा
जन्म मितिः २०७१-१२-१७
स्रोतः शुद्धोधन डेरी फार्म, सियारी, रुपन्देही
राँगाको बाउको ID: Yubaraj
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४००० केजी
राँगाको आमाको ID: D314
राँगाको आमाको दूध उत्पादन प्रति वेतः ३७०० केजी

८. राँगाको नामः **PM-109 (RAHUL)**

जातः मुर्रा
जन्म मितिः २०७६-०६-१७
स्रोतः लाहाचोक डेरी फार्म, पोखरा
राँगाको बाउको ID: Yubaraj
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४००० केजी
राँगाको आमाको ID: 2127
राँगाको आमाको दूध उत्पादन प्रति वेतः ३४०० केजी

९. राँगाको नामः **PM-110 (GYANENDRA)**

जातः मुर्रा
जन्म मितिः २०७६-०७-०१
स्रोतः NLBO, Pokhara
राँगाको बाउको ID: 5647
राँगाको बाउको आमाको दूध उत्पादन प्रति वेतः ४२०० केजी
राँगाको आमाको ID: N214
राँगाको आमाको दूध उत्पादन प्रति वेतः ३२०० केजी