



National **L**ivestock **B**reeding **C**enter
Incorporated Administrative Agency



National Livestock Breeding Center(NLBC), marking its first footprint in 1872, has been at work for more than a century, waging a lot of changes.

Started as a horse stock farm, NLBC was reconstructed as a breeding stock farm after WW2, and has been focusing on improving and breeding dairy cattle, beef cattle, swine and poultry to meet wider variety of food demand.

Recently, NLBC has, under a close cooperation between the head office and 11 stations, played a roll as an agency to contribute to the living in Japan, boosting improvement of breeds of animals, producing and supplying seeds of forage crop, developing new technologies, bringing them into practical use and spreading them nationwide, and managing cattle individual identification information service.

Each footprint of NLBC, made year by year, indicates Japan's history of livestock industry, and its roll will be succeeded toward the future.



For the development of the livestock industry and a healthy diet in Japan

Japan's livestock industry has seen an outstanding development, corresponding to expanding consumption of livestock products such as meat, milk, dairy food; however, if you take a look at the recent situation which surrounds the industry, there are issues to be solved as follows;

- ▶ Reduction of production cost and enhancing quality of livestock products are required in order to cope with progressing internationalization at WTO and EPA negotiation.
- ▶ Cost reduction and managerial enforcement of producers, by means of improvement of animal ability and production control, is necessary in order to strengthen production base while self-sufficiency rate of livestock products is in tendency to decline.
- ▶ It is important to expand domestic production of forage crop to reduce production cost, utilizing farm land effectively and establishing resource circulation model for agriculture.
- ▶ An outbreak of BSE and an emergence of GMO awakens concerns about food security among the people.
- ▶ It is necessary to maintain domestic systems to improve and supply animal breeds, without relying excessively upon overseas animal resources, in case an import of the resources is prohibited when animal infectious diseases such as highly pathogenic avian influenza arise in foreign countries.

In order to correspond to the various agendas, NLBC, as an implementation agency of government policy, wages those services shown below.

- ▶ Boosting improvement of animal breeds, which is a basis to reduce production cost and improve quality of livestock products in order to strengthen international competitiveness.
- ▶ Making practical use of newly developed technologies in the result of enhancement and high efficiency for breeding method.
- ▶ Expanding domestic forage crop production through producing and supplying excellent seeds of forage.
- ▶ Maintaining quality of cattle breeding stock and forage crop seeds through secure arrangement of inspection.
- ▶ Maintaining reliability on food security, offering cattle ID information service, and rigid inspection of GMO.

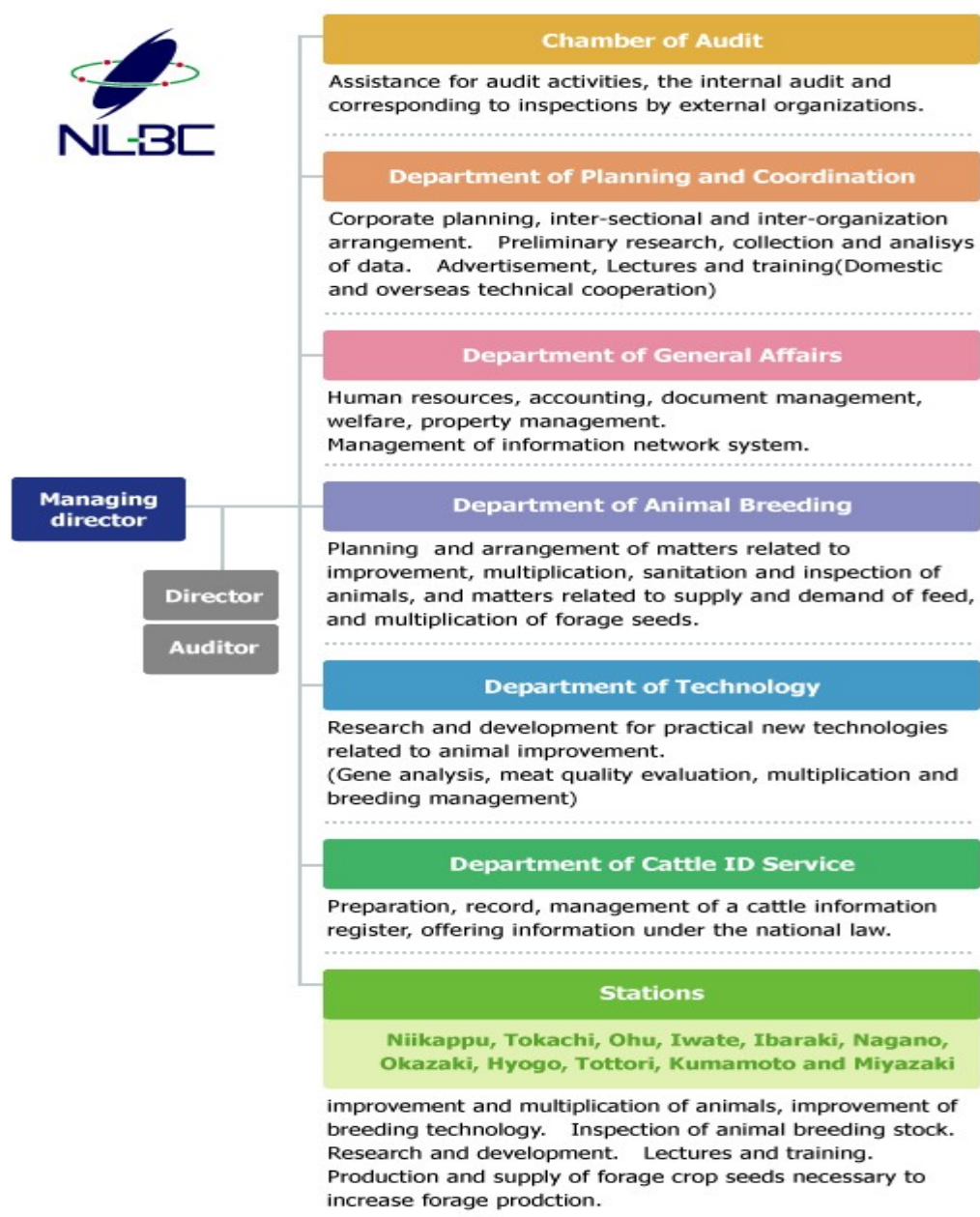


We are to contribute to Japan's people, recognizing our mission to develop livestock industry and healthy diet.

History

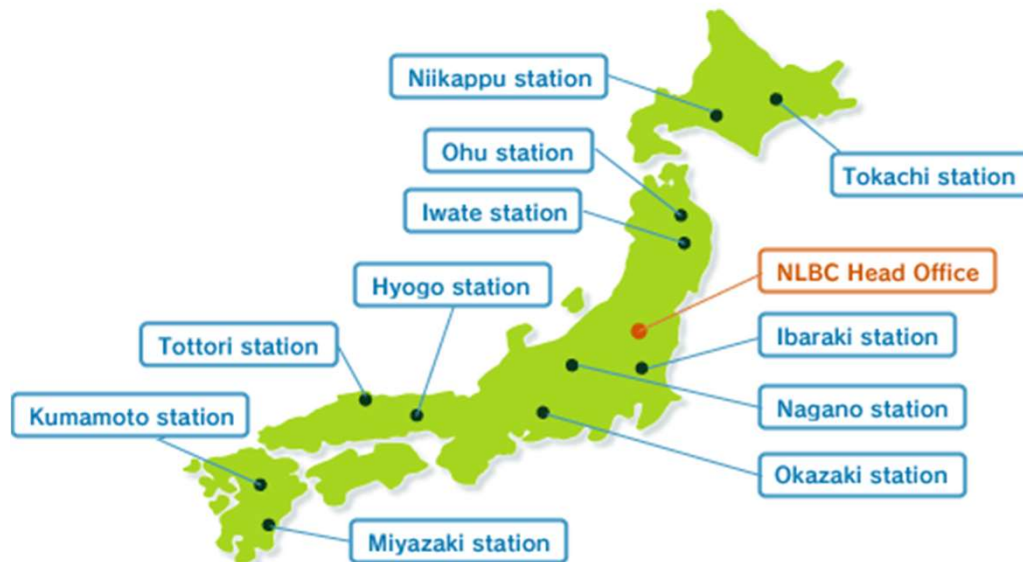
1876~	Founded as a national agency, with imperial stock farms, horse breeding stations and military horse nursery and provision stations nationwide.
1946	Reformed to breeding stations of Ministry of Agriculture, Forestry and Fisheries, abolishing horse breeding stations and other form of stations.
1948	Started services to produce forage crop seeds, in addition to livestock improvement and production.
1967	Started services to issue certificates under OECD scheme.
1990	17 breeding stations were integrated into National Livestock Breeding Center of Ministry of Agriculture, Forestry and Fisheries, with Head Office and 11 stations.
2001	Reorganized to an incorporated national agency.
2003	Started cattle ID information service under national law.

Organization





The Location and responsibility of each station of National Livestock Breeding Center



The Location and responsibility of each station of National Livestock Breeding Center

NLBC Head Office

Hombu Office

1 Odakurahara, Odakura, Nishigo, Nishishirakawa, Fukushima Prefecture
 ZIP 961-8511
 Tel +81-248-25-2231

Shibahara

1 Shibahara, Mafune, Nishigo, Nishishirakawa, Fukushima Prefecture
 ZIP 961-8071
 Tel +81-248-25-2738

Central building for livestock training

1 Odakurahara, Odakura, Nishigo, Nishishirakawa, Fukushima Prefecture
 ZIP 961-8511
 Tel +81-248-25-7060

Niikappu station



587-1 Shizunaimisono, Shinhidaka, Hidaka,
Hokkaido Prefecture
ZIP 056-0141
Tel +81-146-46-2011

Tokachi station



8-1 Komabanamiki, Otofuke, Kato, Hokkaido Prefecture
ZIP 080-0572
Tel +81-155-44-2131

Ohu station



1 Tsurunokotai, Shichinohe, Kamikita, Aomori
Prefecture
ZIP 039-2567
Tel +81-176-62-3281

Iwate station



72-21 Anakuchi, Shimokuriyagawa, Morioka,
Iwate Prefecture
ZIP 020-0123
Tel +81-19-641-2130

Ibaraki station



2330 Fujigaya, Chikusei, Ibaraki Prefecture
ZIP 308-0112
Tel +81-296-37-6511

Nagano station



2029-1 Arakoda, Saku,
Nagano Prefecture
ZIP 385-0007
Tel +81-267-67-2501

Okazaki station



1-1 Kurisawa, Oyanagi-cho, Okazaki, Aichi Prefecture
ZIP 444-3161
Tel +81-564-46-4581

Hyogo station



954-1 Haze, Issai-cho, Tatsuno, Hyogo Prefecture
ZIP 679-4017
Tel +81-791-66-0801

Tottori station



14 Idekami, Kotoura, Tohaku, Tottori Prefecture
ZIP 689-2511
Tel +81-858-55-1511

Kumamoto station



37 Kyoei, Yokoshima-
machi, Tamana,
Kumamoto Prefecture
ZIP 865-0073
Tel +81-968-84-3660

Miyazaki station



5157-29 Hosono, Kobayashi, Miyazaki Prefecture
ZIP 886-0004
Tel +81-984-23-3500



Breeding of livestock animals and improvement of animal husbandry

Production and supply of breeding stock

Improving Japan's staple species of animals, we produce and supply superb breeding stocks, semen and fertilized eggs.

The main targets of improvement

Dairy cattle: Increasing quantity for milk production, improvement of body structure, enhancement of life-long productivity.

Beef cattle: Improvement of meat quality and quantity, conservation of genetic diversity.

Swine: Improvement of intramuscular fat, daily gain, rib-eye area and reproductive performance.

Poultry: Improvement of egg shell strength, deleting meat spot and decreasing fat volume inside abdomen.



A monozygotic twin derived



A live ovum vacuum technology



Sonogram of ovary



Egg shell strength measurement



Production of SPF swine by laparotomy

Promotion of posterity examination

Arranging cooperative relationship among parties concerned, we promote "posterity examination" in order to select dairy and beef sire which can be used all over Japan.

As for cattle, artificial insemination technology being prevailed, lots of semen, taken from excellent sire, are in use. That is why it is important to select excellent sire by judging their ability properly. While the potential productivity of milk or meat, which sire have in their gene, can not be directly estimated, we have to judge after the ability of the posterity (children) are proven in a number of examples.

Evaluation of genetic ability

NLBC offers evaluation information of dairy and beef cattle and swine, which is standardized nationwide, so that producers can improve animals by themselves, and the information can also be used for "progeny test".

As for dairy cattle, we compare Japanese dairy sire with sire in leading dairy farming countries, taking part in the INTERBULL program.

* Genetic ability evaluation

Achievements of milk or meat production of animals are affected not only by genetic elements but environmental elements such as animal husbandry technique and climate condition.

Therefore, the genetic ability is estimated after eliminating environmental elements by processing statistically massive data of animal ability, blood and husbandry



Report book of dairy cattle ability evaluation



Genetic ability evaluation is waged here.

Inspection of breeding male stock under the "Domestic Animal Improvement Law".

As for bull, boar and stallion, a small number of male animals are used in a form of semen for artificial insemination all over Japan. Therefore, if male animals have a disease, the disease would rapidly spread throughout the nation. NLBC carries out the inspection, under the "Domestic Animal Improvement Law", to certify that bulls, boars and stallions, used for multiplication throughout Japan, are free from infectious and genetic diseases.

Conservation of the genetic resources of livestock.

As a part of the gene-bank service for agricultural life resources, a variety of genetic resources of livestock are conserved in a form of living animals, semen and embryos.



Miyako



Nagoya



Meishan

Improvement of husbandry technology

NLBC improves techniques for livestock husbandry, production and utilization of forage crops, and pasturage, as well as demonstrating and exhibiting them.



Pasturage on unutilized lands



A roll-bailer with fine-cut function



Hay pincher



The Development and Implementation of Animal Evaluation System

Genetic evaluation is an important tool for genetic improvement of livestock animals. The National Livestock Breeding Center (NLBC) develops genetic evaluation systems and implements routine evaluations for livestock animals such as dairy cattle, beef cattle, and pigs. The effects of various non-genetic factors are corrected and pedigree information is considered in the evaluation system using a large amount of field data from all over Japan. The evaluation results are officially announced to public.

Dairy cattle genetic evaluations in Japan

Dairy cattle evaluation is implemented using milking records through the Dairy Herd Improvement Program (the secretariat: Livestock Improvement Association of Japan Inc.), and using pedigree and type classification records by the Holstein Cattle Association of Japan Inc. (HCAJ). The results of the evaluation for domestic bulls (progeny-tested sires) are officially published in this English website. Based on the results of the evaluations, it has been carried out to a comprehensive genetic improvement taking account of production, durability, health, and fertility components.

NLBC has participated in the Interbull international evaluation services since 2003, which estimates international evaluation values using genetic correlation among the participating countries. It has become possible to compare the genetic abilities of Japanese bulls and other countries' bulls according to the evaluation results. The results of the evaluation for foreign bulls are officially published in this English website.

Genomic evaluation has been introduced to Dairy cattle evaluation since 2013, and the genomic evaluation was firstly implemented for heifers without a record. Genomic evaluation for progeny-tested sires and young bulls has been implemented since Feb. 2017, and the results of progeny-tested sires and young bulls have been published in this English website.



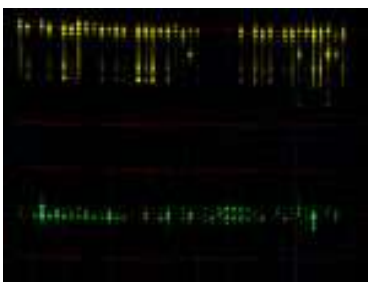
Research and Development-Developing new technologies and bringing them into practical use

Breeding and genetic improvement of farm animals by new technology focusing on molecular genetic technique.

Studies are being conducted to identify genes or linked genetic markers affecting economically important traits of farm animals for Japanese food production. Applications to livestock improvement are also being investigated.

The genes identified by NLBC

- The gene involving the resistance to mastitis of dairy cattle.
- The genes involving the conception rates in cows.
- The gene involving the fatty acid composition in beef which affects its taste.
- The gene involving the inosine 5'-monophosphate, which contribute to *umami* taste, content in beef.
- The gene involving the litter size of swine.



An analysis of DNA marker



The family for analyzing the genes affecting reproduction.
(Meishan × Duroc)



The family for analyzing the genes involving meat quality.
(Japanese Black × Limousin)

Developing methods for evaluating the taste of meat

In order to improve livestock animals that can produce meat which responds to needs of consumers, researches are being made on development of evaluation methods for the taste of meat, utilizing sensory assessment and physicochemical analysis. Applications to livestock improvement are also being investigated.



Sensory evaluation of meat



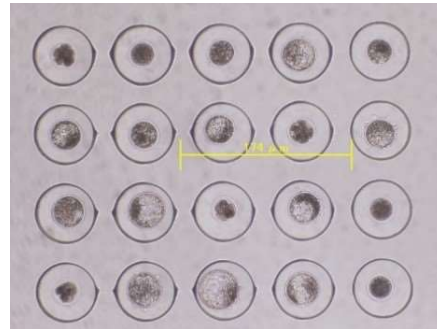
Measurement of physical property of meat



The overseas investigation for the palatability of Japanese WAGYU beef

Improvement of the livestock reproduction technology

NLBC continually strives to improve livestock performance using new technologies including the areas of animal reproduction, particularly in embryo transfer technology. NLBC focuses on research of Ovum Pick-Up and In Vitro embryo Production (OPU-IVP) for cattle, and also non-surgical transfer of vitrified embryos for pig.



Oocytes collection by OPU technique and individual well (WOW) culture system for efficient production of in vitro embryos with high fertility.



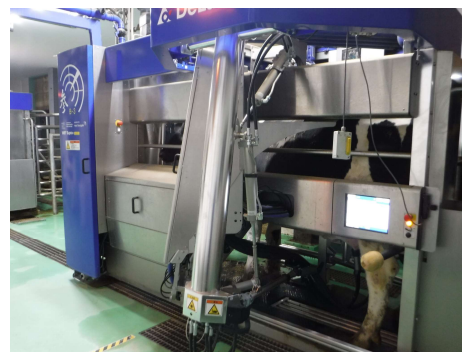
Vitrification of embryos in liquid-nitrogen vapor by Micro volume air cooling (MVAC) method and non-surgical transfer to pig.

Research on the technology involving husbandry

Researches are being carried out on technologies involving husbandry of animals, production and utilization of forage crop, pasturage and processing and utilization of animal excrements.



Fattening experiment

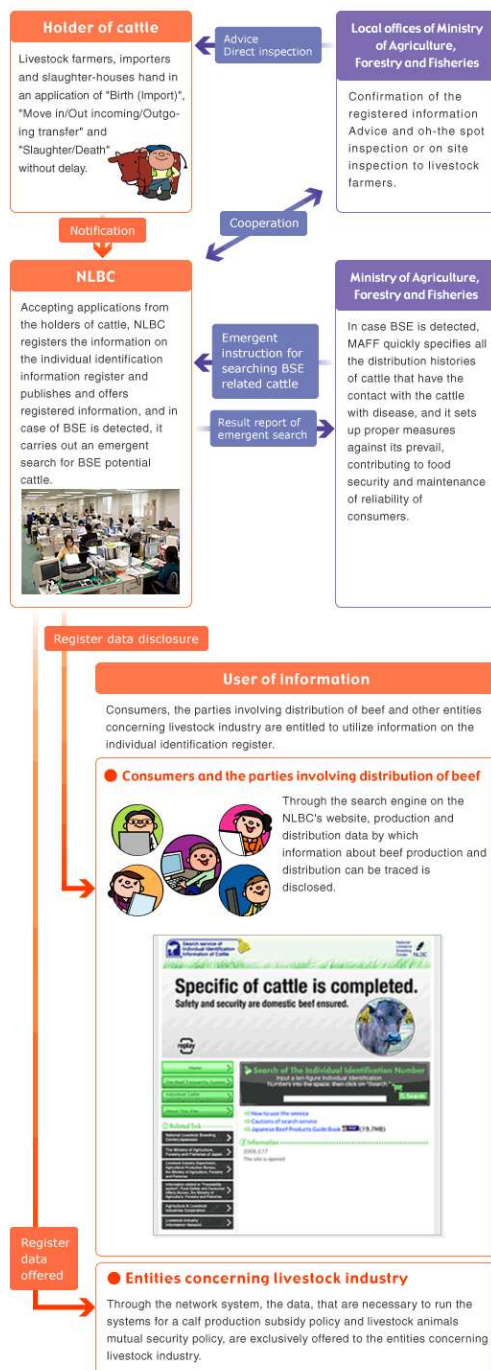


Robot milker



Service of individual identification information of cattle

Service of individual identification information of cattle, using information registered under "the Law for Special measures Concerning the Management and Relay of Information for Individual Identification of Cattle," contributes to preventing the spread of bovine spongiform encephalopathy (BSE), and to maintain reliability of businesses relating livestock industry. NLBC manages individual identification register (data base system), and records information properly, and also discloses information recorded in the Register publicly.





Production, Supply and Inspection of Forage Crops Seed

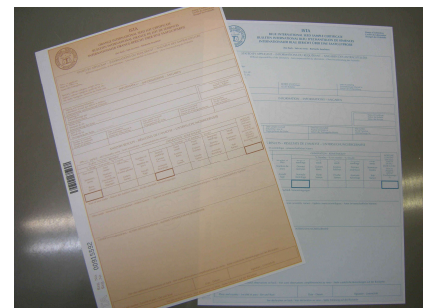
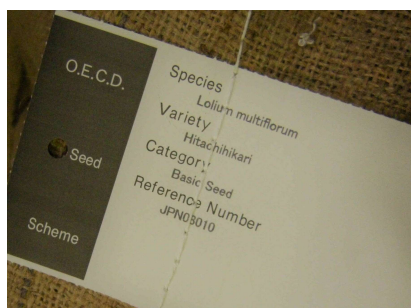
Production and Supply of Forage Crops Seed

For newly developed varieties of forage species, a small quantity of stock seeds need to be multiplied over several generations. Seed production activities at NLBC's Stations have made a contribution to promotion of the superior varieties (in some significant traits; e.g. yields, nutritive value, disease resistance, lodging resistance) developed by public research institutes.



Inspection and Seed Testing under International Framework

To assure the varietal identity and purity of seed, any adverse factors (e.g. contamination arising from pollen, off-type plant, volunteer plant) must be removed throughout seed production process. NLBC has been eligible, since 1973, to make an inspection for these factors according to OECD Seed Schemes that provide the requirements for seed varietal certification. For seed quality aspects, NLBC has been the ISTA Accredited Laboratory, since 2003, which is competent in seed sampling and testing.



Market Control of Forage Crops Seed under the "Plant Variety Protection and Seed Act"

NLBC is one of agencies eligible for monitoring of domestic seed market in accordance with the Act. Commercial seed packages are inspected for those integrity and trueness of labeling under the direction of Ministry of Agriculture, Forestry and Fisheries (MAFF).



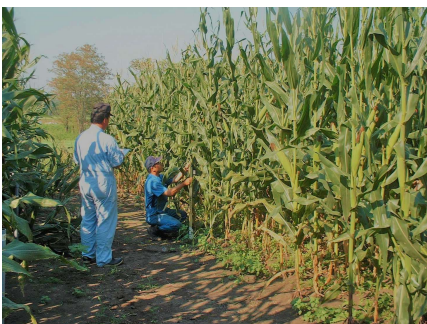
Genetic Resource Conservation for Forage Crops

NLBC acts for a part of Genebank program to preserve broad range of genetic resources.



Field Trial of Newly Developing Varieties

New candidate material developed by public research institutes undergoes the field trial at NLBC's Stations for evaluation of those performances.





Extension and training of animal husbandry techniques, and overseas technical cooperation

Extension and training of animal husbandry techniques

The Central Livestock Technical Training and Seminars, organized by Ministry of Agriculture, Forestry and Fisheries, provides a wide variety of professional courses, in which livestock technician participate such as prefectural officials and the other concerned parties. The Livestock Technical Training Program organized by NLBC provides training to transfer the new techniques to be extended their practical application in the field for the senior technicians such as local government officials, technical staff of the livestock industry cooperative/associations and farmers.

In addition to above training services NLBC also provides a facility for local governmental and industrial meetings and dispatches its specialists to training seminars organized by the industry cooperative/associations.



Training course for the senior technical officer on cattle embryo transfer technology

Overseas technical cooperation

In response to the requests by Japan International Cooperation Agency (JICA), developing countries or the other related institutions, NLBC provides technical training programs on livestock technologies and administrative issues for overseas technicians such as governmental officials who promote their livestock industry development.

At the same time NLBC dispatches its technical experts to help the development of the countries in a long term mandate or a short term in response to the requests by the government of the countries.



Training for the overseas technicians in NLBC
(AI technique and policy planning)

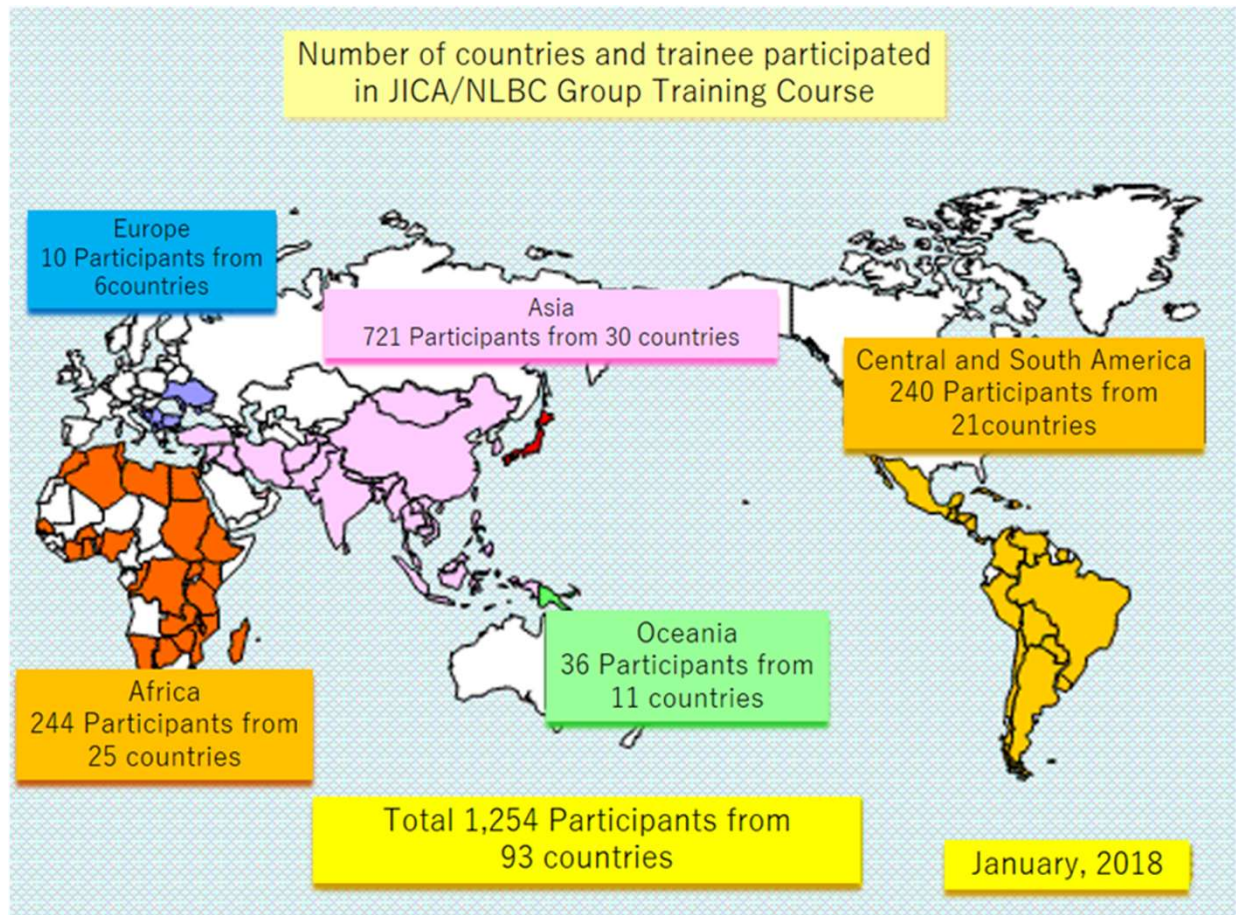


Dispatch of NLBC experts to developing countries

Group training courses for overseas trainee

NLBC organizes a JICA group training course “ Policy Planning and Project Management on Livestock Development for Livestock Officials (for Senior and Middle Level Officials) (2017 -2019) for the technical officials of developing countries’ government and public organizations. Outline of the course is following.

1. Course Period
 - (1) Senior Officials Division (2 weeks)
 - (2) Middle Level Officials Division (3 months)
2. Target Regions or Countries (2017)
India, Indonesia, Nigeria, Pakistan, Fiji, Vietnam, Madagascar, Mali, Myanmar
3. Target Organization
Policy planning and project management unit of central and local governmental departments and related organizations which are responsible to facilitate livestock and rural development.
4. Number of Participants (2017) 14
5. Expected Outcomes
 - (1) Unit 1: Challenges of livestock development plans are explained and shared by Japanese related institutions
 - (2) Unit 2: Essential points so as to formulate, implement/manage national plans are understood
 - (3) Unit 3: Institutional approach necessary to formulate, implement/manage national plans, and facilitations for effective policy extension, gender and development are understood
 - (4) Unit 4: Action plan for livestock promotion, including measures to improve existing plan, are presented
6. Course Contents (Lecture, Practice and Study Trip)
 - (1) Function and organization of central government, local government and industrial association in charge of livestock development in Japan
 - (2) Institutional approach necessary to formulate, implement/manage national plans
 - (3) Institutional approach necessary to facilitate effective policy extension, gender and development
 - (4) Action plan formation as major post training activities for livestock promotion, including measures to improve existing plan in respective countries



Individual training for overseas trainee

NLBC provides the individual training courses for overseas technicians in accordance with “NLBC Special Approved Training Program” which contents would be arranged by the trainees’ interest and request and an availability of NLBC resources.



To visit NLBC

NLBC's Landform and climate

Altitude : Main office and research institutes Area(400m),

Shibahara Area (520-1,110m)

Land : Main office and research institutes Area(121ha), Shibahara Area(968ha)

Year average temperature : 12 C (MAX 36 C, MIN -10 C)

Annual precipitation :1,370mm

How to visit NLBC ?

By rail : Get off at Shin-Shirakawa Station on JR Tohoku Shinkansen or JR Tohoku Line. Five minutes by taxi from the station.

By car : Via Tohoku High-way, get out at Shirakawa I.C., and 50m from the Exit.

address :

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