

National Institute of Animal Science, RDA





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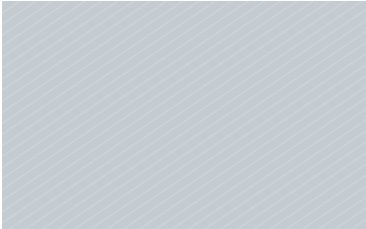
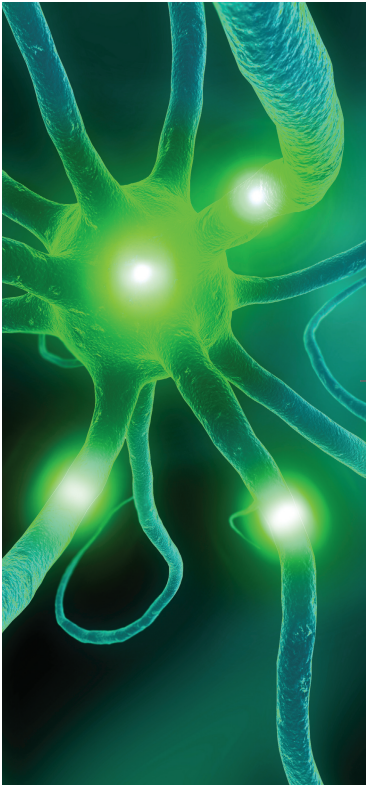
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National Institute of Animal Science, RDA

The National Institute of Animal Science (NIAS) started as the Livestock Technology Center on May 10, 1952 and re-established as the Livestock Experiment Station under the Rural Development Administration on March 1962. After going through several reorganizations, it was renamed to NIAS in 2008. NIAS consists of two Departments, eleven Divisions, one Team and three Stations.

The NIAS strives to raise customer confidence by improving livestock performance, technologies for safe animal products, developing and distributing environmentally-safe technologies. In addition, it creates new values and growth motives for national development through the conversion of advanced biotechnologies such as development of new bio-drugs and organ synthesis using animals. The NIAS also aims to become a global livestock research institute through active exchange of resources and information with international livestock institutes.





History

May 1952	Established as the Livestock Technology Center under the Ministry of Agriculture and Forestry
Mar 1962	Renamed as Livestock Experiment Station with the Rural Development Administration
Apr 1969	Divided into Livestock Experiment Station under the R.D.A and as the National Breeding Stock Center under the Ministry of Agriculture and Forestry
Dec 1994	Reorganized as Livestock Technology Research Institute by combining the Livestock Experiment Station and the National Breeding Stock Center
Jan 2001	Received new mandate to operate as a supervisory operating institute
Jan 2004	Reorganized into Livestock Technology Research Institute under the Livestock Research Institute
Jun 2007	Renamed as Livestock Research Institute under the Institute of Animal Science
Oct 2008	Reorganized into Institute of Animal Science and later became the National Institute of Animal Science

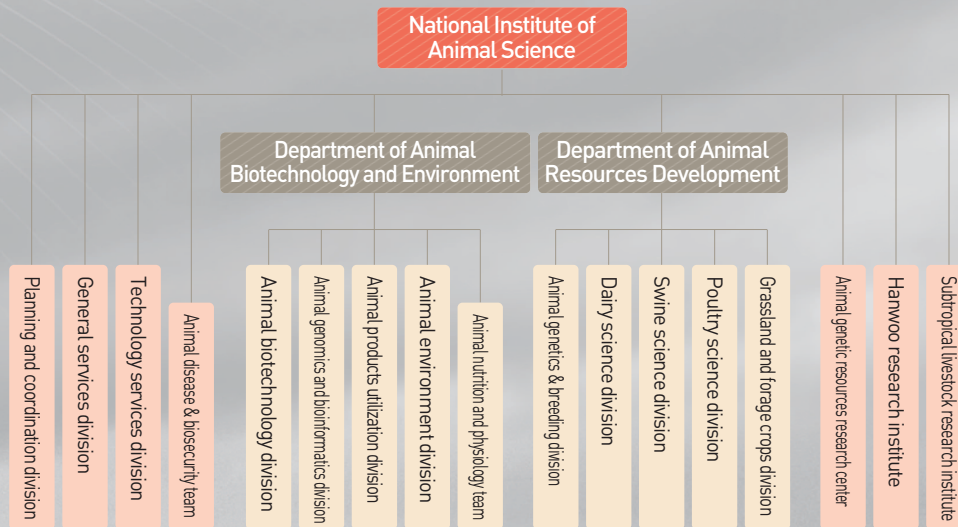
Mission

- Development of new bio-materials through animal biotechnology
- Securing bio-diversity of animal genetic resources and development of high value animal products
- Development of future livestock technology in response to climate change
- Development of stable production technology for animal products
- Animal disease control and biosecurity in NIAS
- Improvement of competitiveness and development of export technology for animal products
- Development of technology to reduce feed cost and promote use of forage
- Development of natural recycling, environmental organic livestock technology
- Development of renewable energy and energy saving technology using livestock resources
- Development of safety control technology for animal foods and animal food products
- Development of improved value-added technology of new functional animal foods
- Provision of support to livestock related research and development agenda projects
- Involvement in affairs related to development and distribution of livestock related technology



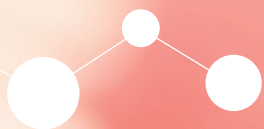
Organization

- Organization; two (2) departments, 12 divisions, 2 teams, 1 center, 2 stations



Location map of NIAS local departments





Establishment of competitive livestock system in response to FTA

In order to manage highly competitive animal businesses in the international markets, NIAS performs research focusing on genetic improvement programs using nationwide seedstock evaluation system.



Establishment of competitive livestock system in response to FTA

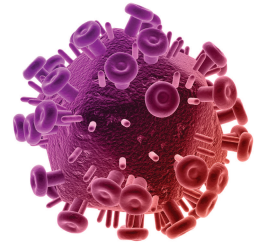
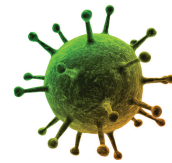


Management of integrated genetic resources based on nationwide breeding schemes.



As a leading group in animal breeding industry sector in Korea, NIAS manages nationwide breeding schemes of Hanwoo and Holstein dairy cattles as well as supervises swine and poultry breeding companies. NIAS has set up breeding targets of various animal species to cope with rapidly changing livestock markets over time. It also developd new technologies to enhance accuracies in genetic evaluation of seedstocks.

- Screening for breeding targets of various animal species
- Selection of Hanwoo and dairy bulls bearing high genetic potentials
- Help on-farm mating decisions with periodicals, computer softwares, and mobile applications
- Participate in Interbull (International Holstein dairy bull genetic evaluation) programs



Hanwoo proven bulls



Holstein Dairy proven bulls



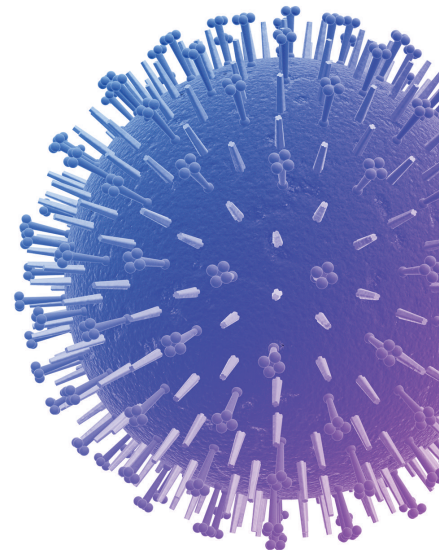
Hanwoo/Holstein cattle mating guides (periodicals and computer S/W)



Mobile application to find optimal Hanwoo mates



Dairy cattle Integrated Management Program (database management S/W)



Production of high quality Hanwoo

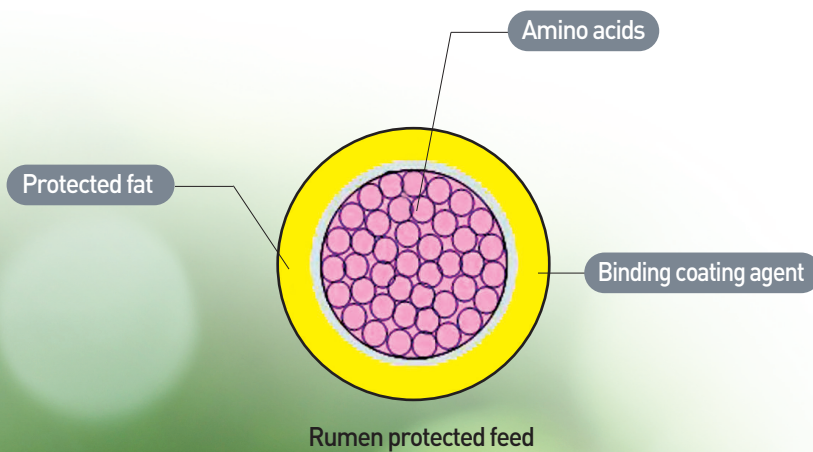


For the continuous development of the Hanwoo cattle industry, NIAS promotes multilateral research for improving competitiveness, including 'development of Hanwoo properties', 'production of high quality meat through Hanwoo breeding', 'development of technology for productivity improvement' and 'establishment of customized stock raising system for individual cattle'.

- Betterment in meat quality through improved feeding and breeding system of cows and bulls
- Formation of Hanwoo lineage to encounter diversification of consumer preference
- Development of heifer or cull cow feeding technology for branded meat production
- Production of healthy and functional Hanwoo beef



Superior Hanwoo Heifer



Management of selected breeding stock



Ultrasonic estimation of meat quality



Development of stable breeding system for high performing dairy cattle



NIAS aims to produce competitive dairy farms by developing new technologies for the production of high-end functional dairy goods to meet customer demands. It also caters to in dairy cattle breeding technology and nutritional management using a cost-effective production system.

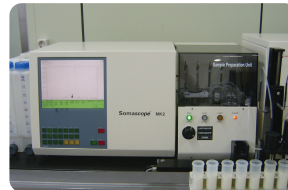
- Securing high performance well-finished dairy cattle bases and improvement of breeding efficiency
- Quality improvement of domestic beef cattle and milk



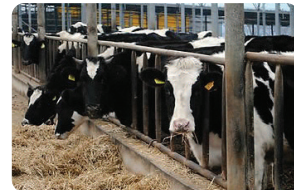
Diagnosis of metabolic diseases of dairy cattle



Automatic estrus alarm of dairy cattle



Analysis of milk quality



Fattening of beef cattle

Improvement of breeder pigs and meat quality

Efforts are geared towards research for improving swine MSY, meat safety, productivity, and quality, as well as restoring Korean traditional breeder pigs and their genetic resources.

- Promotion of breeder pig improvement network project for establishing a national swine breeding system
- Development of technology for enhancing MSY and providing technical services to farmers



ChookjinDuroc



ChookjinChamdon



Synthesized breeding pig



Loin eye of ChookjinChamdon

Advancing improvement of the poultry industry



To further develop the poultry industry and to take advantage of pioneering new export markets, NIAS provides knowledge and research experiences in the areas of utilization of native genetic resources, improvement of feeding management technique, and production of high quality poultry products.

- Development of breeding diversity and industrialization of chickens and ducks
- General consulting and development of large scale layer chicken farm complex
- Production of large broiler chickens to substitute for imported chickens



Red-brown local variety



Yellow-brown local variety



Black color local variety



Environmental monitoring of poultry house

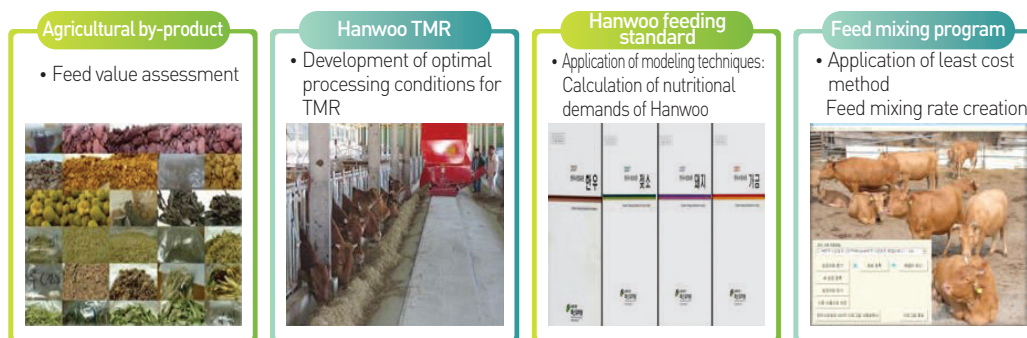


Large chicken vs. regular chicken

Recycling of agricultural by-products for reduced feed cost

Studies for enhancing competitiveness by recycling agricultural by-products and reducing feed cost are being performed

- Distribution of Hanwoo TMR (total mixed ration) utilizing agricultural by-products
- Development of technology for screening and applying by-product-driven useful materials



Technology construction system of Hanwoo TMR with agricultural by-products

Establishment of competitive livestock system in response to FTA



Providing field technical support for advancing livestock industry

We actively and rapidly collect feedbacks of new technologies developed through actual field tests and we also provide field-oriented technical support to maximize various research opportunities

- Provide field consulting for 'small but capable livestock farmers'
- Perform actual field test and economic analysis of new technology



Field consulting by zones



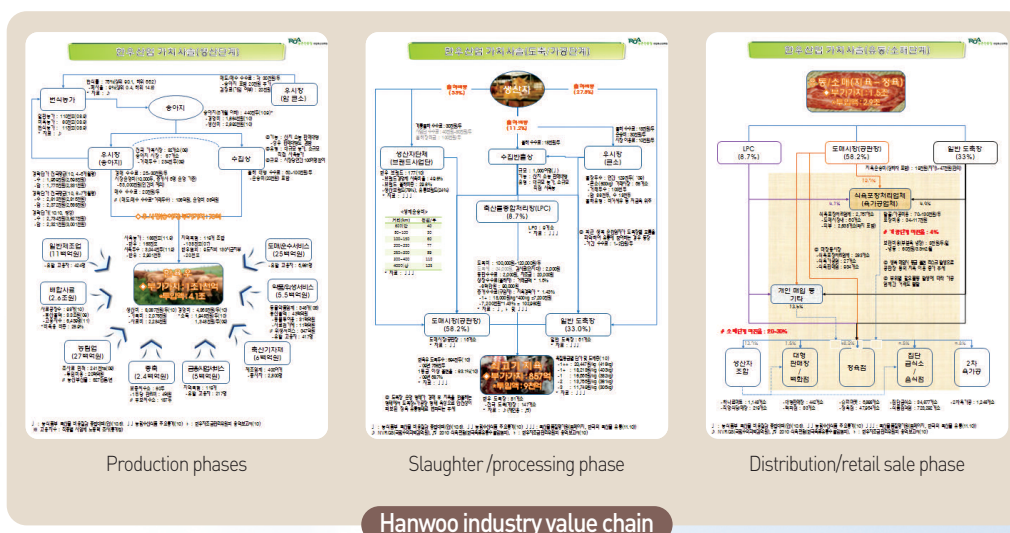
Veterinary examination and animal treatment



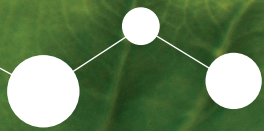
Demonstration of actual field test



Field technical support



National Institute of Animal Science, RDA



Sustainable low carbon green livestock

We develop applicable technologies of recycling animal waste as renewable energy pursuing sustainable eco-friendly green livestock production system. Recently, with the rise of cattle's methane gas production being reported as main cause of global warming, we continue to develop technologies capable of leading low carbon green growth with the development of livestock technologies in response to climate changes.





Design of natural circulation system for treatment and recycling livestock manure



In an attempt to recycle animal manure pursuing eco-friendly environment, we have been developing models of green livestock system which is acceptable to socio-environmental conditions of Korea.

- Development of animal manure recycling and odor-reducing technologies
- Development of biogas productivity improvement technology for anaerobic manure treatment
- Assessment of animal manure treatment facilities and technologies



SCB-M
(Slurry Composting & Biofiltration with Methane)



Offensive odor reducing device
(open-type bio-filter system)



Application of eco-friendly
liquid fertilizer



Liquid fertilizer decay condition
testing instrument

Development of new varieties and cultivation technology for forage crops

To maintain sustainable agriculture, we have endeavored to produce high quality forage crops suitable for Korea's climatic condition. We have also established eco-friendly livestock production system through developing new cultivars of grass and forage crops and maintaining high product quality.

- Development of highly productive forage species for the Korean climate
- Development of cropping systems considering regional infrastructure and inter-seeding technology incorporating winter season annual grasses with Italian ryegrass (IRG)
- Improvement of stored forage quality and various forage processing technologies for a commercialized forage production.



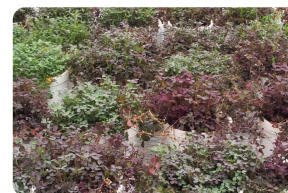
Utilization of early maturing IRG
cultivar (Green Farm)



Inter-seeding forage barley with
Italian ryegrass



Implementing a national base silage
identification system



Development of anthocyanin-based
functional alfalfa

Development of livestock technology in response to climate change

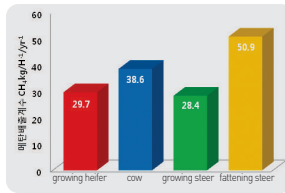


With rapid global climatic changes as one of the most pressing issues, Korea will also contribute to achieve targets of national policies for reducing greenhouse gas emissions and establishing a foundation for the eco-friendly livestock industry.

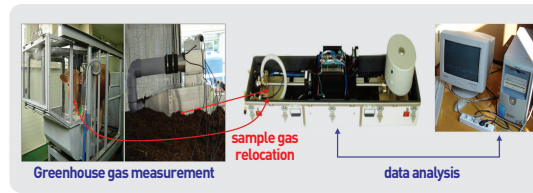
- Development of emission coefficients and assessment of emission amounts of livestock greenhouse gas
- Development of methane reducing technology through improving intestinal fermentation of ruminants
- Development of forage productivity enhancing technology in response to climate change



Measurement of methane gas emission of Hanwoo using respiration-metabolism chambers



Methane emission level of Hanwoo at different growth stages



Greenhouse gas measurement operation system

Development of energy-saving green livestock technology

We contribute to save heating oil as well as improve livestock productivity by providing renewable energy to cope up with high oil prices.

- Development of livestock barn air conditioning and heating technology using geothermal energy
- Development of LED-using technology for energy saving and productivity improvement



Principle of geothermal heating system



Poultry house using geothermal heating



Poultry house using LED lighting



Production of high quality and safe animal products

Placing utmost priority on satisfaction of both producers and consumers, we endeavor to develop quality differentiating technology for animal products, safety control system for animal products and enhanced functional animal product for a safe, clean and green livestock industry.



Development of technology for improving strategy in high quality animal products



Based on meat quality prediction programs considering tenderness and taste factors, we endeavor to set up a palatability grading system for Hanwoo beef and promote consumption of domestic animal products.

- Expanded application of tenderness control system of Hanwoo meat
- Carcass and meat quality investigation of Hanwoo meat



Taste classes labeled by cooking methods

구분	비율(%)	비율(%)	비율(%)	비율(%)
1등급	100%	100%	100%	100%
2등급	0%	0%	0%	0%
3등급	0%	0%	0%	0%
4등급	0%	0%	0%	0%
5등급	0%	0%	0%	0%
6등급	0%	0%	0%	0%
7등급	0%	0%	0%	0%
8등급	0%	0%	0%	0%
9등급	0%	0%	0%	0%
10등급	0%	0%	0%	0%

Taste prediction program



Applied products

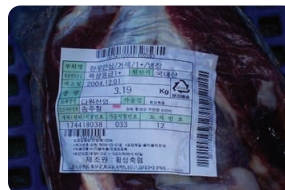
Safety control technology of animal products

In order to enhance customers' satisfaction on animal products, we push forward with research on safe animal product systems managing from production to consumption.

- Development of individual identification technology and management for applied products by animal species
- Development of diagnosis, control and assessment technology on animal food hazardous factors
- Development of natural alternative agents



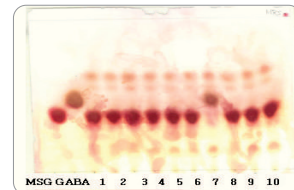
Cattle rearing phase production history system



Animal product slaughtering phase production history system



Development of alternatives to in-feed antibiotics



Production of GABA substance

Production of high quality and safe animal products



Development of functionality-enhanced animal foods



By improving value of non-preferential pork parts and milk, we contribute to increase in income of farmers and al promote public health through:

- Development of customized, enhanced functional milk for milk consumption promotion.
- Development of custom-made animal products



Natural cheese contest



Blood sugar reducing goat milk



Collagen application effect



Fermented fresh ham of swine hind leg

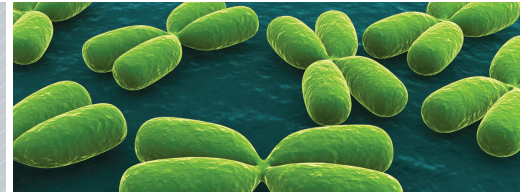


Construction of future livestock platform as a bio-industry

Using biotechnology regarded as a key technology of the future industry, we have created new growth motives of national development by 'increasing researches on animal genomics, bioinformatics, and genetic resources conservation assessments', 'generating transgenic animals for new biopharmaceuticals and xenotransplantation', 'setting up animal welfare models for advancing livestock industries', and 'establishing platform technology for animal companions'.



Application of transgenic animals: Development of high value materials and commercialization

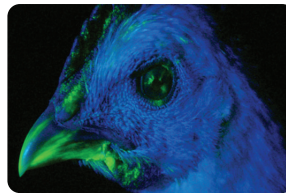


We mainly focus on producing transgenic pigs for biopharmaceuticals and xenotransplantation.
We also give efforts on the production of elite domestic animals.

- Develop technology for practical use and industrialization of biopharmaceuticals
- Produce transgenic pigs for xenotransplantation and xenograft into non-human primates
- Produce and distribute government elite service guard dogs.



Human diabetes mellitus model pig

Transgenic miniature pig for
xenotransplantation

Transgenic chicken



Government elite service guard dog

Assessment of animal genomic study and their generic resource conservation

We develop species conservation and application technologies through construction of animal genomics and bioinformatics management system, operation of national management system, fertilized egg transplantation, germ cell conservation, and development of species conservation and application technology.

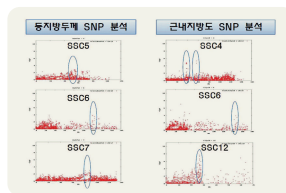
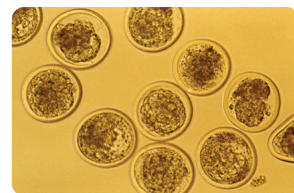
- Reinforcement of screening, collection, conservation and property assessment of traditional animal genetic resources
- Reinforcement of national management system of animal genetic resources and encountering international issues
- Development of gene markers for early selection of high-performance animals



Korean black cattle



Korean brindle cattle

Meat quality related markers by
chromosomesFreeze conservation and proliferation
(fertilized egg)

Advancement in livestock industry and establishment of animal welfare models



To further improve livestock industry through the development of animal welfare models, the Korean livestock industry will push for the production and supply of improved quality safe animal products to its customers.

- Support to administrative projects such as introduction of livestock business license systems
- Development of stock raising facilities and establishment of certification criteria considering animal welfare
- Development of farm facility for animal welfare



Grazing Hanwoo



Rearing facility alternating farrowing crate



Open type layer chicken cage

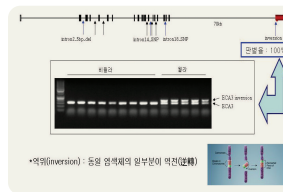
Establishment of platform for research on rearing animal companions

Study on rearing of Korean riding horse varieties and animal companions also serves as a priority under industry research being part of the daily culture.

- Rearing and industrialization of Korean riding horse as a new source of income.
- Development of feed materials for companion dogs and distribution of nutritional management technology
- Identification of genetic markers for Korean traditional dog to keep it as a fine dog and for globalization purposes.



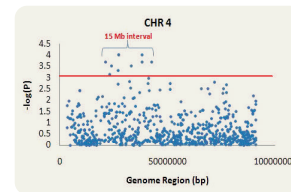
Korean riding horse



Genomic analysis related to fur color of riding horses



Development of feed materials for companion dogs



Gene marker of dog hip joint dislocation