

Greenhouse gas emissions

Greenhouse gas emitted in livestock farming are largely caused by methane from cattle and pigs. The Group is conducting joint research with universities and other organizations on methods to reduce methane emissions from livestock.



Livestock excreta

We effectively utilize livestock excreta, which is the most abundant and environmentally impacting waste product within our Group, as a resource by converting it into compost and biofuel.



Disease control

To prevent the outbreak and spread of livestock diseases, the NH Foods Ltd. Research and Development Center has developed an antigen detection kit, contributing to the promotion of the livestock industry and a stable supply of fresh meats.

Animal welfare

We have eliminated the use of gestation crates to reduce stress on pigs, and are also improving the breeding environment to reduce stress in cattle and chickens.

Various challenges faced by the Japanese livestock industry

To achieve sustainable livestock farming, the NH Foods Group is conducting research on methane reduction to cut greenhouse gas emissions, developing carbon neutral farming, and improving animal welfare. Additionally, we are supporting efforts to address labor shortages and disease control across the entire livestock industry.

Labor shortages

Amidst increasingly serious labor shortages in the livestock industry, our Group provides a smart pig farming system for livestock farmers and offers comprehensive management guidance.



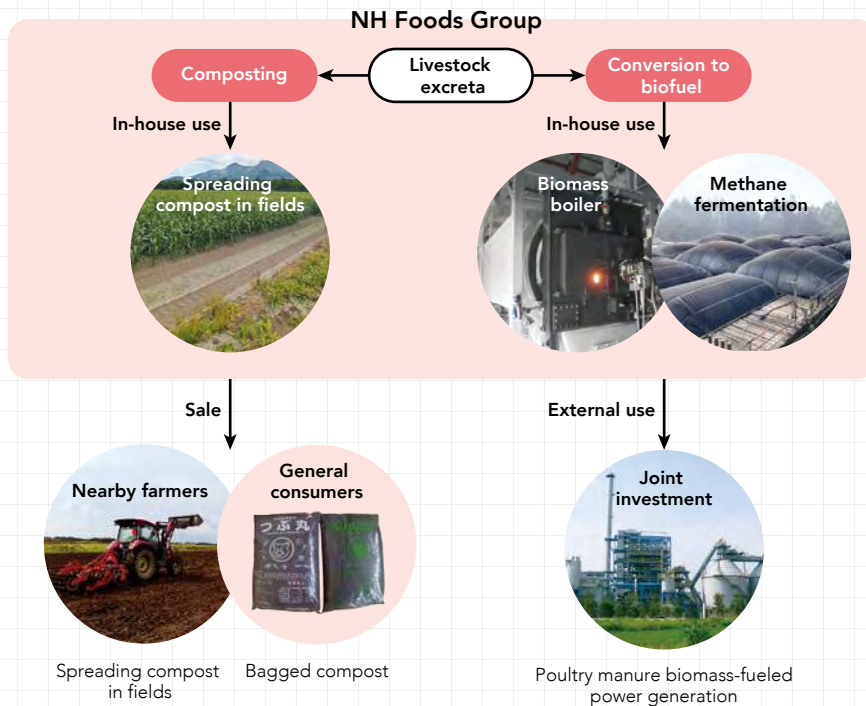
Environmentally conscious livestock farming

Specific environmental issues in livestock farming include the disposal of livestock excreta and greenhouse gas emissions. The NH Foods Group is working to reduce these environmental impacts through research and initiatives such as effective utilization, with the aim of achieving sustainable livestock farming.

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Converting livestock excreta to biofuel and compost

We have consistently engaged in the production, rearing, and sale of pigs and chickens in Japan and cattle in Australia. Our Group effectively utilizes all manure produced when raising livestock by converting it into compost or biofuel depending on its intended use, and treats urine to purity levels beyond standards set by wastewater regulations before discharging it into rivers and the sea.



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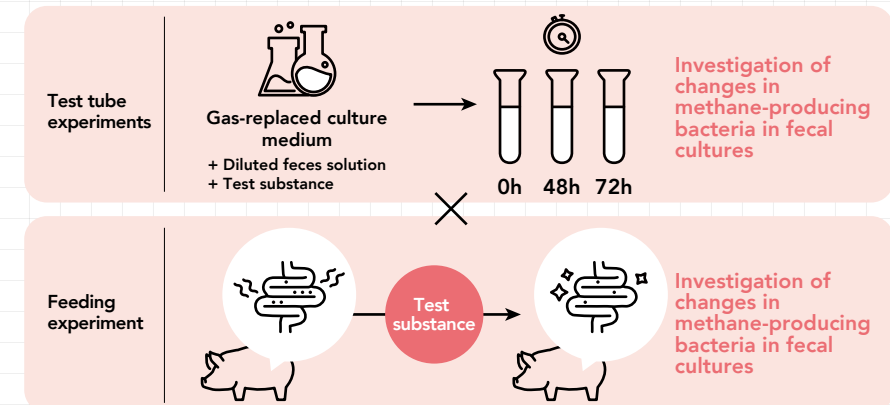
Research on reducing livestock-derived greenhouse gas emissions

The NH Foods Group is conducting research on methane, an area of rising global attention, in collaboration with Hokkaido University and Tokushima University, each focusing on specific themes.

In partnership with Hokkaido University, we are studying methods to suppress methane production in bovine rumen. With Tokushima University, we conducted research on the effectiveness of reducing methane from pigs through in vitro verification and actual feeding experiments with pigs. This research with Tokushima University delivered certain results in fiscal 2024, and has therefore been deemed complete for now, with an eye to scaling up and expanding research going forward.

Research on the relationship between intestinal microbiota and reduction of greenhouse gas emissions in pigs in collaboration with Tokushima University

Culturing pig feces, conducting comprehensive analyses in test tubes, and conducting feeding experiments with pigs to study the reduction of greenhouse gas emissions from the digestive tract



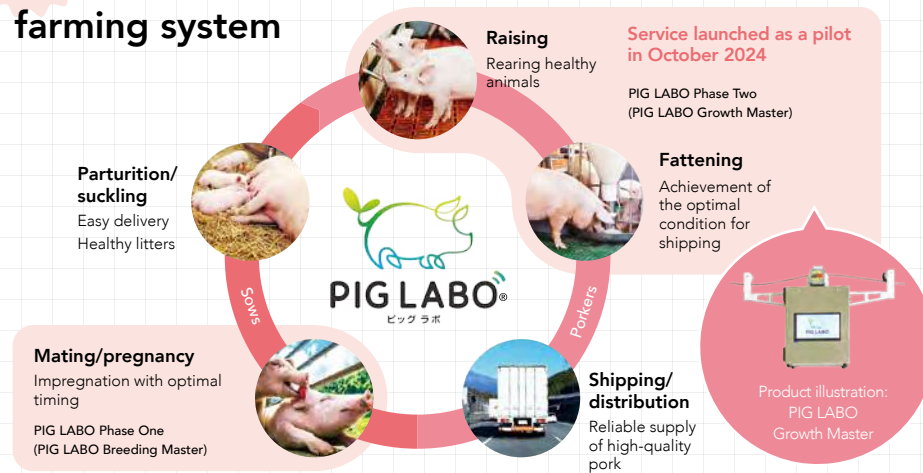
Addressing labor shortages

The NH Foods Group has developed the AI-driven PIG LABO smart pig farming system, provides technical support to local contract farmers, and helps to cultivate the next generation of agricultural talent.

Through these efforts, we aim to improve productivity and grow the industry as a whole.

01

PIG LABO smart pig farming system



Pig rearing involves many tasks that require skills and experience of veteran farmers, making the transfer of skills to future generations a major focus of concern. To address this issue, the NH Foods Group has developed the PIG LABO system, which provides comprehensive support from sow breeding to piglet rearing and shipment. As the first phase, we developed an AI-based estrus detection system called PIG LABO Breeding Master and introduced it at Nippon Clean Farm Ltd.'s Raiman Farm in December 2023.

Since October 2024, we have also launched pilot sales of the second phase, PIG LABO Growth Master, developed in collaboration with a research group from the University of Miyazaki's Faculty of Engineering. This system uses 3D cameras mounted on cables installed within pig pens to capture images, which are then analyzed by AI to estimate pig weight, calculate the weight distribution of the herd, and determine the average weight. Since there is no need to move pigs during weight measurement, stress on the pigs is reduced, contributing to both animal welfare and improved productivity.

02

Technical support for contract farmers

To promote the sustainability of local small-scale farmers, we are supporting the improvement of their livestock farming skills. At Nippon White Farm Co., Ltd.'s Miyazaki Business Division, we provide guidance on a wide range of management tasks from breeding to temperature control, including sanitation and feed programs, for contracted farmers.

Additionally, we offer practical support services such as poultry house cleaning, repairs, and preparation for receiving chicks.



Top-left: Inside a poultry house
Top-right: Poultry house cleaning
Bottom: Meeting with a contracted farmer

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Supporting the next generation of human resources

In December 2017, the Group signed a comprehensive cooperation agreement with the Obihiro University of Agriculture and Veterinary Medicine to contribute to the training of future generations of farmers and the development of the livestock industry. Since 2018, the Group has been providing on-site practical training and university lectures for teaching staff and veterinary medical students at the university. This program offers more practical education with hands-on experience in animal health management, disease prevention, and food sanitation, providing knowledge that cannot be gained through university classes alone. We are also contributing to the realization of next-generation human resources development, the rejuvenation of the livestock industry and the fostering of livestock technicians who can work internationally by sharing information so that research findings can be used in society.

In our practical training programs in 2018 and 2019, participants joined observation tours of Group farms and processing lines so they could learn about some of the workflows involved. However, since 2020, we have been holding lectures remotely in consideration of measures to control outbreaks of communicable diseases such as avian influenza and swine fever.

Animal welfare and disease control

The NH Foods Group promotes sustainable livestock farming with an emphasis on animal welfare and disease control. We are working to reduce stress on animals, including by eliminating gestation crates for pregnant sows and improving the rearing environment for cattle and chickens. In addition, we develop and provide livestock disease testing kits to prevent the occurrence and spread of disease, supporting a stable supply of fresh meats.

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Reducing stress on pigs by eliminating gestation crates

Nippon Clean Farm Ltd., which handles the Group's pig rearing business for fresh meat production, is working to help sows be as close to their natural behavior as possible at its Oshamambe Chirai and Oshamambe Ayame Farms in Hokkaido Prefecture and Raiman Farm in Aomori Prefecture by eliminating gestation crates. We are also installing cameras at all farms and processing plants with the goal of enhancing the environment for and quality of rearing livestock.

In addition, we are conducting research on enrichment, which involves creating a rearing environment suited to the natural habits of pigs, and are making improvements based on our findings regarding methods, effects, and impacts.



A free-range sow gestation house
(Nippon Clean Farm Ltd.)



Raiman Farm

02

Reducing stress in cattle and chickens with better rearing environments

In order to cope with recent extreme heat during summers, we are working to improve the rearing environment for each type of livestock.

For chickens, we have installed fine misting devices in the chicken coops to alleviate heat stress. In addition, we use cameras installed in poultry houses alongside direct inspections to observe chicken conditions on a daily basis.

For cattle, we have installed sunshades to protect them from direct sunlight and are providing water and feed in a way that takes into account safety and sanitation.



Top-left: A poultry house
Top-right: A chicken farm at Nippon White Farm Co., Ltd.
Bottom: Installation of a sunshade for cattle

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Developing detection kits for livestock disease control

To ensure a stable supply of fresh meats, livestock disease controls are crucial. Even if a livestock disease occurs, establishing a system for preventing outbreaks early on can minimize damage.

The NH Foods Ltd. Research & Development Center, in collaboration with the National Institute of Animal Health, National Agriculture and Food Research Organization, conducted research aimed at developing a simple and rapid foot-and-mouth disease (FMD) antigen detection kit for use at cattle production sites. In 2019, we launched NH Immunostick FMD, the first FMD antigen detection kit in Japan. In 2020, we received the Minister of Agriculture, Forestry and Fisheries Private Sector Research & Development Achievement Award in recognition of the kit's significant contributions to initial prevention of FMD. Since 2023, we have been supplying the further improved NH Immunodetect FMD across Japan, developed under the Strategic Surveillance and Diagnostic System Improvement Promotion Commissioned Project implemented by the Ministry of Agriculture, Forestry and Fisheries.



The NH Immunodetect
FMD detection kit