



National Livestock Resources Research Institute

NaLIRRI At a Glance

NaLIRRI is a **NARO** Center



In Uganda, livestock is valued for its multiple livelihood contributions including household income, food security, accumulating assets and social capital. The sub-sector contributes 7%-9% of the national gross domestic product (GDP).

NaLIRRI's mandate is aligned to national and global development goals. With this, we make our humble contribution to household food security and enhance nutrition and income for sustainable development.



WHO we are

We are Uganda's premier livestock research institute. Our activities cover diverse areas, including improvement of the dairy production chain, productivity in beef value chains, development of vaccines for livestock disease prevention, addressing challenges posed by insects, and commitment to biosafety and biosecurity. NaLIRRI play a pivotal role in contributing to the development and sustainability of Uganda's livestock sub-sector through cutting-edge research and development.

The promise

To contribute to social economic transformation through market oriented and demand driven livestock research.

Our **Genesis** & *Evolution*

1956

NaLIRRI has origins in the colonial era when the East African Trypanosomiasis Research Organisation (EATRO) was founded in 1956 to conduct research on Tsetse flies and Trypanosomiasis in both humans and animals in Uganda, Kenya and Tanzania.

1977

EATRO was handed over to Uganda Government in 1977 and was renamed Uganda Trypanosomiasis Research Organisation (UTRO). UTRO had similar mandate to EATRO but was restricted to Uganda.

1992

UTRO was merged with the then Animal Health Research Centre to form the Livestock Health Research Institute (LIRI) and mandated to conduct research on livestock health and Trypanosomiasis in humans and livestock.

1994

LIRI was taken over by the National Agricultural Research Organization (NARO)

2005

National Agricultural Research Act 2005 establishes NaLIRRI as one of 16 semi-autonomous Public Agricultural Research Institutes under the policy guidance of the National Agricultural Research Organization (NARO).





MISSION

A sustainable and competitive livestock sector offering numerous profitable employment opportunities and nourishing animal food demands of Ugandans.



VISION

To enhance sustainable utilization of appropriate livestock research outputs for improved livelihoods of Ugandans.



MANDATE

NaLIRRI is responsible for research and related services in Livestock Health, Nutrition, Breeding, Socio-economics, Marketing and Apiculture

Our Focus

1 BEEF AND MEAT
RESEARCH
PROGRAM



Enhancing productivity and profitability of meat animals and beneficial insects through better breeds and better health.

2 LIVE STOCK
ENTOMOLOGY
RESEARCH PROGRAM



Technologies addressing constraints posed by insect vectors such as tsetse flies and biting flies while harnessing the potential of beneficial insects like bees, silkworms and black soldier flies.

3 VACCINOLOGY
RESEARCH
PROGRAM



Innovate, develop and manufacture safe, effective and affordable vaccines for better livestock health in Uganda

4 BIOSCIENCES
RESEARCH
PROGRAM



Conventional and biotechnology techniques to improve food and feed quality to address nutrition, safety and livestock health issues

5 DAIRY
RESEARCH
PROGRAM



Innovative technologies for livestock feeding, health and assisted reproduction technologies as well as value addition and bio-waste recycling.

BEEF AND MEAT RESEARCH PROGRAM

LIVE STOCK ENTOMOLOGY RESEARCH PROGRAM

VACCINOLOGY RESEARCH PROGRAM

BIOSCIENCES RESEARCH PROGRAM

DAIRY RESEARCH PROGRAM

Our **Products** & Services

Products	Services
Elite cattle breeds (Uganda Jersey, Fresians, Ayrshire, Guernsy) Quality breeding stock for cattle, goats and poultry Pasture seed Hay silage Liquid slurry manure Solar-dried slurry manure Liquid Nitrogen Organic bio-pesticides	Training in quality feed production and processing Training in feeds and feeding Artificial Insemination services Training in modern manure management and product development Provide knowledge for herd health management Embryo transfer services Semen extraction and evaluation Mobile feed quality testing





Impact on the Livestock Subsector

Major Technological Breakthroughs & Innovations in Livestock Research

- 01 NAROVAC a broad-spectrum anti-tick and East Coast Fever vaccine targeting two tick species
- 02 NARO LABLAB 1 for improved nutrition, milk production and body weight
- 03 NARO dairy pellets for improved calf, heifers, cow performance and income of dairy farmers
- 04 Uganda Jersey cattle breed producing 20-25 liters//day when well-fed
- 05 Value added products from cattle waste e.g., bioelectricity, bio-briquettes, animal feed, detergents, soap, bio-pesticides, bio-fertilizers and bio-gas
- 06 Incubator from locally sourced materials for hatching chicken eggs
- 07 NARO calf pen to improve calf growth and survival among dairy cattle producers for increased milk production and productivity
- 08 Developed and commercialized NARO forage chopper for enhanced efficiency, competitiveness and productivity of dairy farming production systems in Uganda



- 09 Elite flock of Mubende goat breed for improved conservation of indigenous goat breeds of Uganda
- 10 Improved indigenous chicken breed for high productivity and competitiveness
- 11 Trap for control and monitoring of tsetse fly (Ngu-2B) in Karamoja region
- 12 Uganda maps for Foot and Mouth Disease (FMD) outbreaks, risk and suitability
- 13 Patented methods and processes for developing fungal bio-acaricides for control of ticks and tsetse flies in Uganda (Patent Number: UG/U/2018/000013, 2018)
- 14 Bee value added products including propolis tincture, bees wax, wine, honey, bee venom for food and niche pharmaceutical industries
- 15 NARO Botanical Dewormer with 94% mortality of nematode larvae in 24 hours
- 16 Rapid and affordable NARO African Swine Fever (ASF) Diagnostic Kit reducing the cost of diagnosis from UGX 40,000 to UGX 1,400 per sample
- 17 NARO Aflatoxin Binder for Broilers and Layers boosting feed intake, feed utilization and efficiency
- 18 Large Herbarium 'conservation bank' containing close to 800 indigenous species of pasture, legume and fodder varieties.



Our **Dairy** Interventions

Dairy health: Technologies and innovations for control and management of livestock diseases i.e., clinical, preventive approaches and vaccination schedules

Dairy breeding and genomics: Improve dairy breeds through use of assisted reproductive technologies i.e., Artificial insemination (AI) and In vitro Fertilization techniques (IVF)

Dairy nutrition: Technologies, innovations and management practices that improve feed utilization efficiency for milk production and optimal growth rate. We also focus on feed quality assessments, development of farmer tailored nutritious feed packages.

Forage breeding and conservation: Forage improvement and conservation to improve qualitative and quantitative aspects of forage and feed resources, their conservation and use.

Dairy products' development and value addition: Dairy value added products/technologies aimed at increasing farm income, visibility and expansion of new markets by the farmer.



Our **Beef and Meat** Interventions

Livestock Health: Developing technologies and innovations to improve the control of livestock diseases along meat and eggs value and supply chains. Diseases include Brucellosis, Foot Rot and Magnesium deficiency, tick borne diseases such as babesiosis, African Swine-Fever in pigs, Newcastle disease in poultry.

Livestock Breeding: We breed for disease resistance, resilience to climatic extremes and lowering methane; and value chain taste and preference for meat, eggs, hides and skins are prioritized for respective ruminant and non-ruminant.

Livestock Nutrition: We focus on producing innovative approaches and technologies for efficient and sustainable, quality but low-cost feeding of beef cattle and other livestock for meat and non-meat products.

Forage Breeding and Conservation: Developing, utilizing and conserving elite forage resources for different meat and egg production systems. Our forage herbarium comprises over 1000 species for seed multiplication to cater for the growing demand for planting materials.



Our **Entomology** Interventions

Bees: Focus is on both honeybees and stingless bees. Research operations target bee biology and management, botany, health/protection, bee products, and beekeeping equipment. Sericulture: Includes research on moriculture (Mulberry growing) and sericulture (silk worm rearing and silk production).

Insects for food and feed: Employ technologies and innovations for rearing insects that serve as human food (e.g. grasshoppers, crickets, termites and white ants) and insects which are used as protein sources in animal feeds (the black soldier flies and wax moth larvae).

Vector and pest management: Focus is on detection, innovation and development of safer, cost-effective, and environmentally friendly means of vector and pest management. Our research also revolves around protection of livestock forage and feed resources from attacks by arthropods and pests.

Pesticide and environmental safety: We conduct research on pesticide for control of pests and vectors, testing of pesticide efficacies, effects in the environment and monitoring and remedial strategies.

Product development and value addition: We develop different products such as honey, pollen, propolis, venom, royal jelly, wax, silk, edible insects, insects for feed, pesticides, pest management devices and strategies, hives and other arthropod rearing technologies.



Our Livestock Biosciences Interventions

Nutritional Bioscience: Determine nutritional composition of livestock feed quality

Bioinformatics, DNA sequencing, and Diagnostics: Focus on screening and surveillance diagnostic tools for early and improved detection of livestock diseases of economic importance.

Livestock Health: We develop disease monitoring tools, for risk and predictive maps of public health and or zoonotic diseases as well as control strategies to improve both animal and human health.

Molecular Biotechnology: Focus is on livestock species identification, immunology, detection of pathogens and pests infesting livestock. Determines forage diversity and patterns of spatial distribution in different landscapes.

Biochemistry and Pharmacology: Our focus is on determining the biochemistry and pharmacology of herbal plants that provide a basis for ethnoveterinary medicine formulation.

Our Vaccinology Interventions

Viral and Recombinant vaccines : Undertake real-time pathogen genomic surveillance and develop vaccine formulations for crucial livestock diseases including; Anti-tick vaccines, Foot and Mouth Disease, East Coast Fever, African Swine-Fever, Lumpy Skin Disease, Sheep and goat Pox, and Poultry vaccines.

Bacterial vaccines : Develop whole cell-inactivated, sub-unit, and conjugated bacterial vaccines including, Blanthrax, E.coli, Contagious Bovine Pleural Pneumonia and Contagious Caprine Pleural Pneumonia.

Parasite vaccines: Develop vaccines against internal and external parasites such as ticks, tsetse flies and various mosquitoes that cause diseases e.g. Rift valley fever, Yellow fever and associated tick-borne infections.

Vaccine manufacturing and production: With a state of the art vaccine manufacturing facility at Nakyesasa-wakiso, we provide seed materials for industrial vaccine manufacturing and distribution.





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