



CGIAR INITIATIVE | ON SUSTAINABLE ANIMAL PRODUCTIVITY

KEY MESSAGES

- Livestock provides a pathway out of poverty for millions of people and is a unique source of high-quality proteins and micronutrients to improve the nutrition and health of the country's poorest. It also offers a pathway towards women empowerment.
- The CGIAR Initiative on Sustainable Animal Productivity is working in seven countries across 15 livestock value chains to package and scale out tried-and-tested, as well as new, innovations in livestock health, genetics, feed and market systems. In Nepal, the initiative will focus on the buffalo dairy value chain.
- The initiative aims to demonstrate that improvements in livestock productivity can offer a triple win: generating improved livelihoods and nutritional outcomes; contributing to women's empowerment; and reducing impacts on the climate and environment.

THE CHALLENGE

Most agricultural production in the global south takes place in mixed farming systems (MFS). Key drivers – climate change, population pressure, urbanization, water scarcity, changing diets, volatile food prices – mean that flexible and accelerated changes in MFS will be needed to achieve global targets such as the UN Sustainable Development Goals.

OBJECTIVE

The Sustainable Animal Productivity research for development initiative within the One CGIAR, aims to contribute to the transformation of the dairy sector in Nepal through an integrated approach to make dairy production with buffaloes more productive, resilient, equitable and sustainable.

Activity

The objectives of the CGIAR Initiative on Sustainable Animal Productivity will be achieved through testing the following seven innovations in selected buffalo dominated areas and thereafter supporting the national public and private sector actors to scale them to cover the dairy buffalo belt in the whole country: innovation and scaling design to enhance equity.

Capacity-building for mixed farming system design and analyses, to support long-term impact on university and college students, scientists, extension agents, farmers, private sector, policy makers and development actors.

1. Digital genetic gain platform

Information and communication technology (ICT) and genomic tools will be used to address the current challenges and limitations in collecting herd performance data, analysing the data and providing timely feedback to farmers and various actors within the country. The use of

animals under the Pedigree Performance Recording System will also be expanded for large- scale genomic evaluation of the populations and improved selection of breeding bulls and bull dams from within the national population. Further, genomic evaluation of dairy animals and other livestock species will be implemented through relevant training, access to software and data.

2. Digital feed advisory platform

The On-farm Feed Advisor, a farmer-oriented decision support tool, will be used to help farmers with balancing nutrients in their livestock rations. This is especially relevant during early lactation when protein and energy malnutrition is widespread. Subsequent to nutrient balancing, mixing processed roughages and concentrates into total mixed rations (TMR) will improve the diet quality further and increase productivity.

3. Deconstruction of rice straw

Biomass treatment technologies such as bio-fermentation (treatment with lactic acid bacteria) and /or pre-treatment (treatment with steam or soft chemicals) will be used to process rice straw (which forms more than 70% of a typical dairy animal's diet in Nepal) into high-quality feed by removing lignin and improving overall cellulose and hemicellulose content. This will be tested and promoted using appropriate agri-business models.

4. Superior nutrient dense forages

Locally adapted nutrient-dense forages will be introduced and tested first on-station and later on-farm, to respond to year-round feed demands. This has the potential to increase productivity, improve natural resource use efficiency, and adapt to and mitigate climate change. Seed systems will also be developed to ensure that the new seeds are available at the farmers' doorstep.

5. Reproductive and heard health package

An integrated package of practices, which include: (i) deworming (ii) supplementation (vitamins and minerals) and (iii) hormonal treatment following timely artificial insemination protocols will be carried out to address infertility problems in buffaloes. As good body condition score (≥ 2.5) is required for hormonal treatment, overall improvement in management and nutrition will also be taken care of. Some heat detection

tools (ear sensor, vaginal cytology or salivary farming-based method) and pregnancy detector will also be tested as part of the program.

6. Agribusiness and extension models

Sustainable and attractive business and extension models will be developed to deliver quality inputs such as feed, health and genetics products and services with a view to make sustained improvement in the efficiency of input delivery systems and integration of input and output markets. For this a stronger collaboration between input and service providers with dairy cooperatives will be fostered, in particular through village livestock promoters who will be attached to dairy cooperatives and support their village peers in improving the use of and access to appropriate inputs and service.

7. Animal-source foods nutrition communication tool

A decision support tool for researchers and development practitioners will be developed to identify and define food security and nutrition interventions that improve existing diets through integrating animal-source foods; considering the food security pillars of availability, access, utilization, stability, as well as the results of a nutritional demand assessment.

OUTPUTS

- Evidence on effective breeding programs for more productive and resilient dairy breeds available to public and private system.
- Evidence for feed companies to start using economically feasible treatment methods that can substantially improve straw/stover digestibility.
- New forages adapted to three specific socio-economic and agro-ecological contexts developed and available for dissemination.
- Integrated reproductive management package of practices and decision support tools for improving buffalo productivity available.
- Evidence on inclusive institutional arrangements that ensure sustained improvement in efficiency of input delivery systems and integration of input and output markets.
- Evidence on economically feasible business models to make available for input/output marketing.

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