

# ISHAAZI

The Livestock Farmers' Magazine

CATTLE • GOATS • SHEEP • POULTRY • PIGGERY • RABBITS • FISH • GAME

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## FOOT & MOUTH DISEASE: RISKS & OPPORTUNITIES FOR UGANDA

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AGRI-FINANCING for livestock farmers

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# PROMOTE SUPPLEMENTARY FEEDING PROJECT UNDER THE (MOBIP) PROGRAMME 2019-2021



**MAAIF**  
Ministry of Agriculture  
Animal Industry and Fisheries



Uganda  
Beef  
Producers  
Association



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# THE EDITOR'S Note

Dear Readers,

**A**s we proudly present the 7<sup>th</sup> Issue of *Ishaazi Livestock Farmers' Magazine*, we find ourselves at a pivotal moment in the livestock sector—a time of reflection, innovation, and renewed commitment to sustainable growth. Building on the momentum of our previous editions, this issue delves deeper into the challenges and opportunities shaping the future of livestock farming in East Africa and beyond.

The past year has been one of significant transformation, marked by evolving geopolitical dynamics, climate change pressures, and the urgent need for food security. As we navigate these complexities, it is crucial to reflect on our journey so far, celebrate our achievements, and chart a clear path forward. This issue is designed to equip you with the knowledge, tools, and inspiration to not only adapt but thrive in this ever-changing landscape.

One of the standout topics in this edition is the increasing role of



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**regenerative livestock farming**—a model that not only boosts productivity but also enhances soil health, biodiversity, and climate resilience.

Additionally, we shed light on how **solar-powered water pumping** is revolutionizing farm efficiency, offering a sustainable and cost-effective solution to water access

challenges. Our industry experts provide insights into livestock financing, agribusiness models, and value addition to help farmers maximize profitability.

At **Ishaazi**, we remain committed to **empowering and educating farmers** through practical knowledge and real success stories. Whether you're a commercial farmer, a smallholder producer, or an agripreneur exploring new opportunities, this issue is designed to equip you with the tools and insights you need to thrive.

Your feedback and engagement remain the driving force behind our work. Together, we can foster a thriving and sustainable livestock industry that not only meets the demands of today but also secures a prosperous future for generations to come.

Thank you for being part of the *Ishaazi community*. Let's continue to grow, innovate, and transform the livestock sector — one issue at a time.

Enjoy the read!



## Our Distribution Outlets

The demand for the Magazine is growing every day and we still need more points of sale countrywide. Please contact us on the telephone numbers and email below if you would like to be our distributor. The Magazine can be found at the following locations; **Kampala - Quality supermarket Naalya, Best Buy supermarket Bukoto, All City Oil Savers supermarket (Café Javas), ORYX Shop Bunga, ORYX Shop Buziga, ORYX Shop Lugogo, Bonjour Shop TOTAL Mengo, Kweywayo Vet Pharmacy container village; Light Shoppers, Kajjansi, Masaka - Kweywayo Vet Pharmacy; Mbarara - Kirabo Vet Shop, Farm Pharmacy, Kweywayo Vet Pharmacy Mbarara branch; Kiruhura - Mogas Shop Rushere; Ntungamo - Ntungamo Dairy Farmers' Cooperative (NDAFCO) Centre.** We also endeavor to participate in all major agricultural events such as the Jinja annual agricultural show and several farm clinics where thousands of farming enthusiast meet. We continue to get more points of distribution including major book stores like Aristoc, Uganda Bookshops and more farm input supply shops. The regional distribution is done by News Point in major East African Cities.

We wish you a great farming yield and a happy 2025. Please continue to send us feedback to guide us make your experience better.

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# Foot-and-Mouth Disease surge in Southern Africa: Risks and opportunities for Uganda's livestock sector

**S**outhern Africa is currently grappling with an escalating outbreak of Foot-and-Mouth Disease (FMD) a highly contagious viral disease that affects cattle, sheep, goats and other cloven-hoofed animals with confirmed cases now established across multiple countries including South Africa, Zimbabwe, Botswana, Eswatini and Mozambique. The spread of the disease is posing serious economic, trade and food-security challenges for livestock producers throughout the region.

## A region under strain

South Africa remains the epicentre of the current FMD crisis, with outbreaks reported across several provinces prompting quarantine zones and strict animal movement restrictions. These measures, while essential for containment, have already disrupted livestock production and trade, costing the beef and dairy sectors significant revenue in lost exports and increased disease-control costs.

Zimbabwe's veterinary authorities have verified active outbreaks near the Botswana border, exposing the vulnerabilities of communal grazing systems where cattle and small ruminants mix freely. Botswana, for its part, has instituted immediate quarantine and enhanced surveillance in affected districts to protect its beef export credentials.

In Eswatini and Mozambique, authorities have suspended livestock sales and tightened movement controls to prevent further transmission. Such interventions have deep implications not only for producers' incomes but for local food security and rural livelihoods.

## Economic and trade impacts

Foot-and-Mouth Disease is notorious for its trade ramifications. Once a country is designated as affected, it typically loses its FMD-free status, triggering export bans on live animals and livestock products especially beef and dairy until the disease is controlled. This has already resulted in diminished export revenues, weakened confidence among trading partners, and economic strain on value chains from ranchers to

processors.

Smallholder farmers across the region, many of whom depend heavily on livestock for both income and nutrition, face rising costs, lost markets and deeper rural poverty. The broader livestock industry is being challenged to respond with coordinated action rather than isolated national measures due to the highly transboundary nature of the disease.

(source: <https://www.ccardesa.org/foot-and-mouth-disease-spreads-across-southern-africa-raising-economic-and-trade-risks>)

## What this means for Uganda

For Uganda's livestock sector, the Southern African FMD situation presents both a warning and an opportunity:

### 1. Reinforcement of preparedness and biosecurity

Uganda has been proactive in strengthening its FMD control mechanisms. In 2025 the country validated an updated Risk-Based Strategic Plan (RBSP) aimed at improving surveillance, diagnostics and vaccination strategies against FMD and other transboundary diseases.

This heightened focus on early detection and risk-based intervention can help Uganda reduce vulnerability to regional outbreaks and protect market access.



**The broader livestock industry is being challenged to respond with coordinated action rather than isolated national measures..**

## 2. Potential for market advantage

While Southern African producers grapple with export suspensions and quarantines, Uganda can leverage its strengthened disease-control systems to solidify existing regional and international market relationships, especially for live animals and processed livestock products. Demonstrating sound animal health credentials could make Ugandan beef and dairy more attractive to importers seeking stable, disease-free sources.

## 3. Leadership in regional cooperation

FMD outbreaks highlight the need for harmonised animal health strategies across Africa. Uganda could position itself as a leader in East African regional coordination, sharing best practices in surveillance, vaccination planning and early response mechanisms with neighbouring countries through platforms like the East African Community (EAC).

## 4. Boosting Private-Sector and farmer engagement

The current Southern African crisis underscores the importance of engaging farmers, veterinarians, and private partners in biosecurity and vaccination campaigns. Greater partnerships can help expand coverage and resilience across

Uganda's livestock networks — from the central cattle corridor to remote pastoral communities.

## A Strategic imperative

Ultimately, while the spread of Foot-and-Mouth Disease in Southern Africa presents serious risks for producers and traders, it also brings into sharp relief the value of proactive disease management, regional cooperation, and strategic livestock development planning. For Uganda's livestock industry — a key driver of rural livelihoods and agricultural GDP — this moment should serve as both a cautionary tale and impetus for renewed investment in animal health systems that support productivity, market access and long-term growth.

## Foot-and-Mouth Disease Ravages Southern Africa, Creating Export Edge for Uganda

Southern Africa's livestock industry grapples with widespread Foot-and-Mouth Disease (FMD) outbreaks, affecting cattle, sheep, goats, and pigs across key nations and sparking severe trade bans and economic losses.

## Regional Outbreak Details

Confirmed FMD cases have hit South

Africa hardest, with infections spanning multiple provinces, quarantine zones, and demands for a national disaster declaration amid billions in beef and dairy export shortfalls. Zimbabwe reports outbreaks in Matabeleland South near Botswana, while Botswana's northeastern Masunga district enforces strict movement controls to safeguard its premium beef markets. Eswatini has halted livestock sales as the crisis nears emergency levels, and Mozambique's Moamba district battles spread fueled by low vaccination rates and porous borders.

## Trade and Economic Fallout

These outbreaks strip affected countries of FMD-free status, triggering global bans on live animals and products like beef and dairy, hammering revenues, jobs, and smallholder incomes. Regional experts urge unified surveillance, vaccine drives, and border biosecurity to curb the transboundary threat, warning of lasting damage to food security without swift action.

## Uganda's Strategic Opportunity

While Uganda manages its own FMD challenges through a 2026-2031 national control strategy, bi-annual vaccinations targeting 44.5 million animals, and PCP-FMD progression, the southern crisis opens doors for Ugandan beef and dairy. With Southern African suppliers sidelined, Uganda's livestock sector—bolstered by recent vaccine imports and export certification efforts—can seize regional and international market share, boosting farmer incomes and trade volumes if disease controls hold firm.





# Agri-financing for livestock farmers: Bridging the funding gap in Uganda

**L**ivestock farming is the backbone of Uganda’s rural economy, providing livelihoods, food security, and employment for millions. According to the Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF), over 70% of rural households depend on livestock for income and sustenance. Despite its critical role, the sector faces a persistent challenge: limited access to affordable and tailored financing. This funding gap stifles productivity, innovation, and growth, leaving many farmers trapped in cycles of poverty.

## The livestock financing gap: A barrier to growth

For smallholder livestock farmers, the cost of quality feeds, veterinary care, modern equipment, and improved breeds often exceeds their financial capacity. Financial institutions, wary of the perceived risks associated with agriculture—such as fluctuating market prices, climate-related uncertainties, and lack of collateral—are reluctant to extend credit to farmers. As a result, many farmers resort to informal lenders who charge exorbitant interest rates, perpetuating cycles of debt and limiting their ability to scale operations.

Dr. Fred Bwino Kyakulaga, Uganda’s State Minister for Agriculture, emphasized this challenge during the 2023 National Livestock Conference: “Access to affordable financing remains a critical barrier for our farmers. Without it, we cannot

*achieve the productivity levels needed to meet the growing demand for livestock products.”*

## Innovative financial solutions for livestock farmers

To address this gap, several tailored financial solutions have emerged, offering hope to Uganda’s livestock farmers:

### 1. Agricultural Credit Facility (ACF):

Launched by the Bank of Uganda in partnership with commercial banks, the ACF provides loans at subsidized interest rates of up to 12% annually. Farmers can use these funds to purchase quality breeds, construct animal housing, or invest in processing equipment.

### 2. Savings and Credit Cooperative Organizations (SACCOs):

SACCOs, such as the Uganda Livestock Farmers’ Cooperative, have become vital for rural farmers. These member-driven institutions offer low-interest loans tailored to livestock farming needs, including feed, veterinary care, and insurance.

### 3. Microfinance Institutions (MFIs):

Institutions like Pride Microfinance and FINCA Uganda provide small loans with flexible repayment terms, designed to align with farmers’ income cycles. Their agro-focused products cater specifically to the unique needs of livestock farmers.

### 4. Development partners and NGOs:

Organizations like Heifer International Uganda and Send a Cow Uganda offer grants, soft loans, and capacity-building programs. These initiatives empower farmers with both financial resources and





technical knowledge to optimize their operations.

**5. AgriTech innovations:** Digital platforms such as Ensibuuko and EzyAgric are revolutionizing access to credit. Through mobile technology, farmers can apply for loans, make payments, and access training on best practices. These platforms use data-driven approaches to assess creditworthiness, reducing reliance on traditional collateral.

**Case study: Transforming lives in the Ankole sub-region**

The Ankole sub-region, renowned for its cattle farming, exemplifies the transformative power of tailored financial solutions. Farmers here have benefited from SACCOs like the Ankole Farmers' Cooperative Union, which provides affordable credit for improved breeds, modern kraals, and milk processing equipment.

Alex Kabunga, a cattle farmer in Ankole, shared his success story: *“Before joining the SACCO, I struggled to keep my farm afloat. The loan I received allowed me to buy better feeds and hire a veterinarian. Within two years, my herd’s productivity doubled, and I’m now supplying milk to larger markets.”*

**Overcoming barriers to accessing financing**

Despite these promising solutions, challenges remain. Many farmers lack awareness of available funding opportunities, while others face complex application processes and rigid collateral requirements. To address these barriers, stakeholders must take coordinated action:

- **Capacity building:** Farmers need training in financial literacy, loan application processes, and effective farm management to maximize the benefits of borrowed funds.
- **Policy support:** The government should continue providing guarantees for agricultural loans, reducing risks for financial institutions and encouraging greater lending to the sector.
- **Improved outreach:** Financial institutions and NGOs must intensify awareness campaigns, particularly in rural areas, to ensure farmers know about available options.

**Looking ahead: A sustainable future for livestock financing**

The future of Uganda’s livestock sector hinges on bridging the financing gap. By fostering partnerships between financial institutions, development organizations, and the government, the sector can unlock its full potential. Farmers, too, must embrace these opportunities, recognizing the importance of financial discipline and strategic investment in achieving their goals.

As Hon. Frank Tumwebaze, Uganda’s Minister of Agriculture, noted during a recent stakeholders’ meeting: *“When we empower our farmers with the right tools and resources, we are not just transforming individual lives—we are building a resilient and sustainable agricultural sector that can drive national development.”*

**Conclusion**

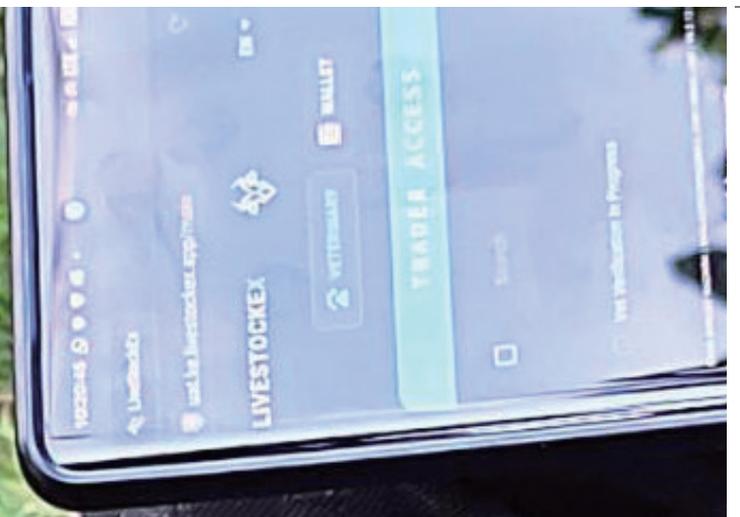
Uganda’s livestock sector holds immense potential, but realizing this potential requires addressing the financing gap that hinders growth.

**Through innovative financial solutions, capacity building, and policy support, stakeholders can empower farmers to increase productivity, improve livelihoods, and contribute to the nation’s economic development. The journey toward a thriving livestock sector is challenging, but with collective effort, it is within reach.**

**For Further Reading:**

- Agricultural Credit Facility (Bank of Uganda)
- Heifer International Uganda
- Pride Microfinance Uganda
- Ensibuuko Technologies
- Uganda Livestock Farmers’ Cooperative





# The digital innovation is transforming livestock trading amongst East Africa's farmers

**A**cross East Africa, a quiet revolution is unfolding in the livestock sector one driven not by tractors or new breeds, but by digital technology. As traditional livestock markets struggle with inefficiencies, logistics challenges and value leakage to middlemen, innovative digital platforms are emerging as game-changers.

At the forefront of this change is LiveStockEx, Kenya's pioneering feedlot-focused digital livestock marketplace, which is reshaping how farmers feed, track and sell animals and offering a model ripe for adoption in Uganda.

**A digital marketplace that does more than just list animals.**

Unlike conventional livestock auctions where farmers trek long distances with cattle, goats or sheep to crowded yards, LiveStockEx provides a transparent, secure and efficient digital ecosystem connecting all actors in the value chain from producers and vets to buyers and transporters on one platform. Farmers can:

- Upload animal details and get vet verification to build trust and independence from brokers.
- Access feedlot financing that helps improve animal performance, especially during periods of feed scarcity.
- Receive secure digital payments through widely used mobile money systems.
- Reach buyers across regions without leaving the farm.

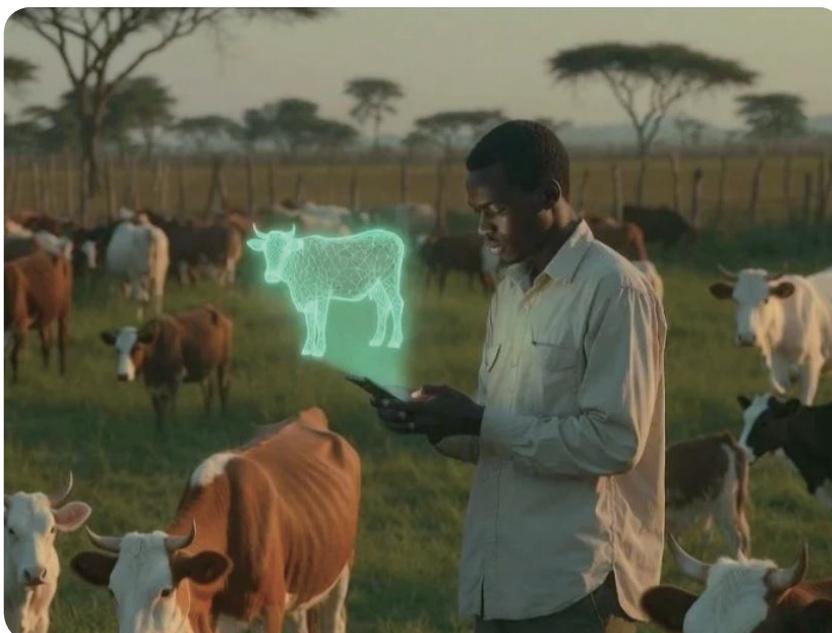
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**LiveStockEx provides a transparent, secure and efficient digital ecosystem connecting all actors in the value chain from producers and vets to buyers and transporters...**

This is more than an online marketplace it's a trust-based ecosystem built on verified animal health records, transparent pricing, secure payments and traceable transport logistics. According to the platform's founders, this model makes livestock trading "simple, profitable, and data-driven," giving farmers far more control over price discovery and market access than traditional systems ever could.

### **Feedlot Integration: boosting quality and profitability**

One of the most transformative elements of this tech-driven model is the feedlot-focused programme. Rather than depending solely on open grazing which is vulnerable to droughts, poor pastures and inefficiencies the feedlot approach





offers targeted animal nutrition, performance monitoring, and financing options. This not only reduces time to market readiness but also improves meat quality and yield, making producers more competitive in formal and export markets.

### **The Opportunity for Uganda's Livestock Sector**

For Uganda with its vast cattle corridor, growing livestock population and expanding mobile connectivity the success of digital livestock trading platforms in Kenya offers a compelling blueprint:

**i. Expand market reach & transparency**  
Ugandan farmers could tap into

digital marketplaces that allow buyers from urban centres or neighbouring countries to bid on animals virtually. This would broaden market access, improve price transparency and reduce reliance on physical markets.

**ii. Improve traceability & health management**  
Digital platforms naturally integrate animal health records, tagging and vet verification critical tools for disease control, export certification and improved herd management.

**iii. Attract Finance & Investment**  
By providing credible data and transparent transaction records, digital livestock marketplaces can help farmers access credit, insurance and investment areas often denied to rural producers

under informal market systems.

**iv. Boost youth engagement**  
Technology-based trading attracts a new generation of agripreneurs and data-savvy youth, fostering innovation in rural economies.

In combination, these gains would enhance producer incomes, strengthen value chains, and support Uganda's ambitions to become a more competitive livestock exporter in regional markets.

### **A new chapter for livestock trade**

Digital livestock trading is not just a technological upgrade it's a reimagining of the livestock value chain, bringing fairness, efficiency and opportunity to those who drive rural economies. Platforms like LiveStockEx demonstrate that when farmers have access to markets, finance and verified data at their fingertips, the entire sector stands to benefit.

**As East Africa embraces digital transformation, Uganda's livestock stakeholders from policymakers and agribusinesses to cooperatives and farmers should consider how similar innovations can unlock market potential, improve livelihoods and future-proof the livestock economy for decades to come.**



# From herder to innovator: The Cowboy's journey to revolutionizing Uganda's dairy industry

An exclusive Q&A with **Enock Nuwahereza**, Uganda's tech-savvy dairy farmer and social media sensation

**Q: Enock, you're known as "The Cowboy" to many. Can you tell us a bit about yourself and what you do?**

**A:** Absolutely! My name is Enock Nuwahereza, and I'm a 25-year-old dairy farmer, milk processor, agricultural consultant, and tech enthusiast. I run a 50-cow dairy farm in Kikube, Kyarushesha, where I not only produce milk but also process it into yogurt for local markets. I'm also the founder of Farmers Eye, a company that provides solar-powered surveillance systems to help farmers manage their operations remotely. My mission is to bridge the gap between traditional farming and modern technology, proving that agriculture can be both profitable and innovative.

**Q: Your journey into farming is quite unique. What inspired you to venture into agriculture, considering you initially dreamed of becoming an engineer?**

**A:** I grew up in Masindi, where I learned to herd cattle before I could even read. Back then, I dreamed of becoming an engineer because I was fascinated by gadgets and machines. But during my Senior Six vacation, while helping my parents on the farm, I realized the untapped potential in Uganda's dairy sector. I saw how a lack of technical knowledge was holding the industry back, and I decided to do something

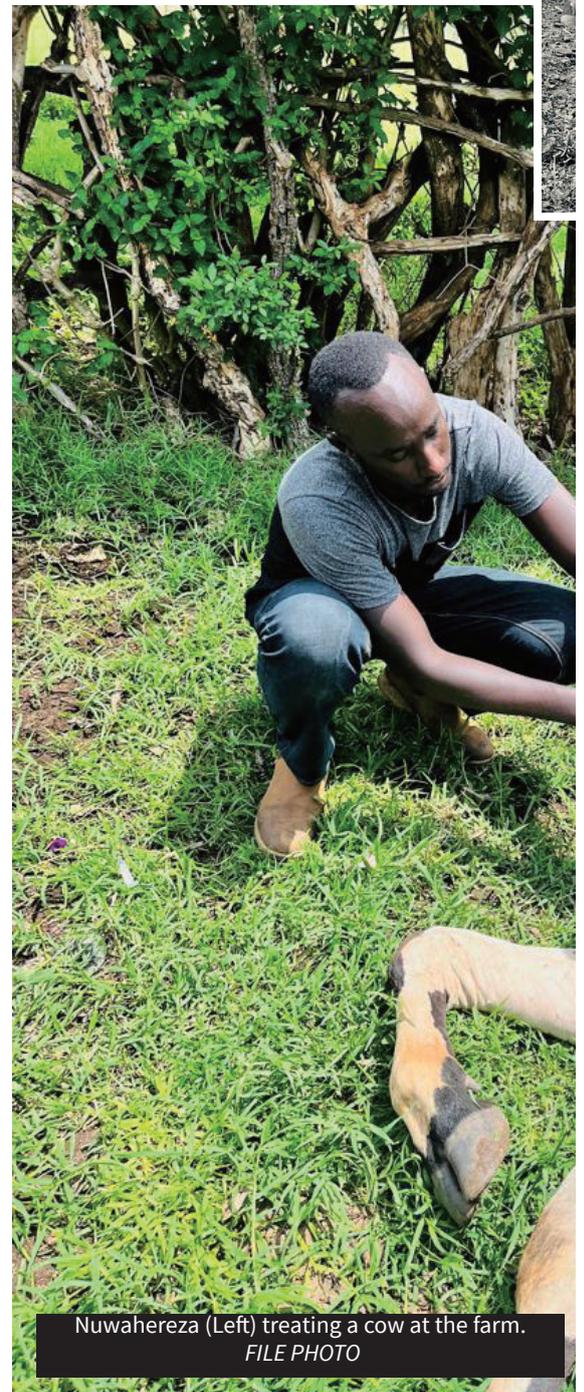
about it.

In 2019, I enrolled at Makerere University to study Industrial Livestock and Business. Then, in 2021, I was selected for Israel's Agro Studies Programme, where I spent a year learning about high-tech dairy farming—everything from automated milking systems to sustainable pasture management. That experience completely changed my perspective and showed me what's possible when you combine farming with technology.

**Q: Your ability to blend agriculture with technology is remarkable. You've gained quite a following on social media as "The Cowboy." How did that start, and how has it impacted your work?**

**A:** It all began during the 2020 COVID-19 lockdown. I was bored while grazing cows, so I started posting funny videos and facts about cattle on Twitter. I called myself "The Cowboy" as a playful nod to my roots, and to my surprise, the content went viral. When I went to Israel, I started sharing daily lessons from my training, and my following grew even more.

Today, my social media presence is more than just a platform—it's a community and a marketplace. I sell premium Charolais breeding bulls, attract consultancy clients, and connect with farmers from all over the world. It's amazing how social media has opened doors for me, allowing me to share knowledge and



Nuwahereza (Left) treating a cow at the farm.  
FILE PHOTO

Cowboy Enock Nuwahereza. FILE PHOTO



inspire others to embrace modern farming practices.

**Q: That's an incredible way to utilize digital platforms! What are your future plans for expanding your impact? What's next for you and your farm?**

**A:** I have big plans! I'm working on integrating solar-powered irrigation, AI-driven herd management, and expanding my milk processing line to include cheese and butter. Through Farmers Eye, I aim to equip 500 farms with affordable solar surveillance systems by 2025.

But my ultimate dream is to turn my farm into a training hub where farmers can learn modern techniques firsthand. I want to show them how technology can transform their operations and help them achieve better yields and profitability.

**Q: What's your vision for Uganda's dairy industry?**

**A:** I envision a Uganda where dairy farming is a thriving, tech-savvy industry. I want to see every farmer using data to boost yields, minimizing milk waste, and producing high-quality dairy products that can compete globally. I believe we can achieve this by embracing innovation, learning relentlessly, and supporting one another.

**Q: What advice do you have for fellow farmers who want to modernize their operations?**

**A:** Start small. You don't need a big budget or a degree to make a difference. Share your story online, add value to your products, or partner with a neighbor to pool resources. Embrace technology, even if it's just a simple solar-powered camera or a mobile app for tracking expenses. Most importantly, never stop learning. Follow me on Twitter (@enockk256) for daily tips, and let's work together to make Ugandan dairy farming the envy of

“

I envision a Uganda where dairy farming is a thriving, tech-savvy industry. I want to see every farmer using data to boost yields, minimizing milk waste, and producing high-quality dairy products that can compete globally...”

the world.

**Q: Finally, what does “The Cowboy” mean to you?**

**A:** “The Cowboy” isn't just a nickname—it's a movement. It's about challenging the status quo, embracing innovation, and inspiring others to see the potential in agriculture. It's a reminder that with passion, persistence, and a little bit of technology, we can transform not only our farms but also our communities and our country.

**Interviewer: Thank you, Enock! Your story is truly inspiring, and we look forward to seeing your impact on Uganda's livestock industry.**

**Enock Nuwahereza:** Thank you for having me!

Enock Nuwahereza, “The Cowboy,” is proof that the future of farming lies at the intersection of tradition and technology. Follow his journey and join the movement to revolutionize Uganda's dairy industry.

# Boosting livestock farm productivity and sustainability through solar-powered water pumping solutions in Uganda

## The water crisis in Uganda cattle corridor.

For Ugandan farmers, water is the lifeblood of their operations. Whether cultivating crops, rearing goats, or raising cattle, access to a reliable water supply is critical. Yet, in many parts of the country, inconsistent rainfall and dwindling traditional water sources have made farming a precarious endeavor. Prolonged droughts, particularly in the cattle corridor, have left livestock farmers struggling to provide water for their livestock.

A new era of water access has been emerging—one

powered by the sun. Livestock farmers are now turning to the sun to power their farms. Solar-powered water pumping systems are not just a technological innovation—they are a lifeline, transforming agriculture and offering hope for a more sustainable and prosperous future.

**From smallholder farmers tending to goats and cattle to large-scale crop cultivators, this technology is making a significant impact. And with companies like Green Power International Limited**

**leading the way, Ugandan farmers are now embracing solar energy to fuel their growth.**

## The benefits of solar-powered water pumping

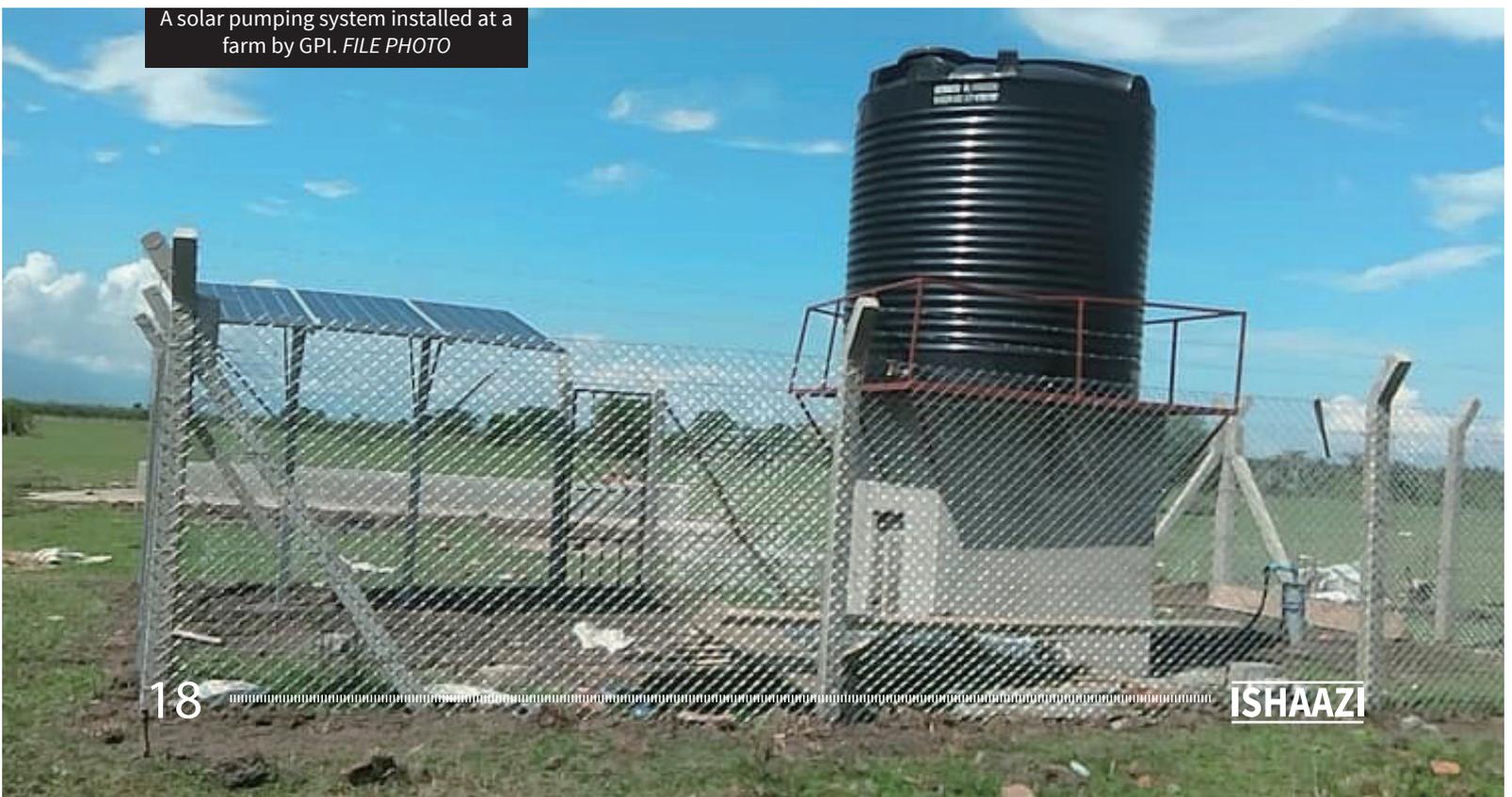
### 1. Reliable water supply

In regions where rainfall is unpredictable, solar-powered water pumps offer a dependable alternative. By drawing water from boreholes, rivers, or reservoirs using energy from the sun, the solar-powered systems ensure that farms have access to water year-round.

### 2. Cost saving that adds up

Diesel-powered pumps are not

A solar pumping system installed at a farm by GPI. FILE PHOTO



only expensive to run but also require constant maintenance. Solar-powered systems, on the other hand, operate on free sunlight, slashing operational costs.

At Kiboga Farmers' Cooperative in central Uganda, switching to solar-powered pumps reduced annual fuel costs by over 70%, freeing up resources for better seeds and fertilizers.

### 3. Eco-friendly farming

Unlike diesel pumps, which contribute to greenhouse gas emissions, solar-powered pumps are eco-friendly and sustainable. By adopting this technology, farmers play a crucial role in fighting climate change while protecting local ecosystems.

*The Mbarara District Environmental Protection Agency has been actively promoting solar-powered water pumping as part of its initiative to reduce carbon footprints in rural areas.*

### 4. Scalability for every farm

Whether you're managing a small plot or a large-scale agricultural enterprise, solar water pumping systems can be tailored to meet your needs.

### How we have done it all to ensure water availability for livestock farms

#### Northern Ranchers, Gulu

Northern Ranchers installed a 2.2 kW solar water pumping system to supply 24,000 liters of water per day for their goats and cattle. The result? Healthier animals, increased weight gain, and higher milk production—all of which have boosted the ranch's profitability.

#### Glad Farm Limited, Kapeeka

Glad Farm Limited installed a 4.5 kW solar water pumping system capable of supplying 40,000 liters of water per day.



A Green Power International Technician installing a solar system at a farm. FILE PHOTO

Since the installation, the farm has reported a 30% increase in milk production, enabling it to expand its market reach and improve profitability.

#### Herbert Farm, Kiruhura

Herbert Farm, known for its traditional breed of cattle, struggled with water scarcity during the dry season. A

15 kW solar water pumping system was installed to draw water from a nearby river, ensuring that cows had constant access to fresh water. The result? Healthier, more productive cattle.

At Nakasongola Ranch, a sprawling cattle farm in northern Uganda, a scalable 6 kW solar water pumping system was installed to support both irrigation and livestock watering, ensuring optimal performance for herds of all sizes.

**Nyakamenta Mix Farm, Mbarara District:** A 15.75 kWp system supplies over 60,000 liters per day, supporting coffee plantations.



A solar pumping system installed at a farm by GPI. FILE PHOTO



A cattle farm powered by GPI's solar pumping system. FILE PHOTO

### Transforming crop cultivation

For crop farmers, water shortages can mean lower yields and financial losses. Traditional irrigation methods, often reliant on manual labor or expensive machinery, can be inefficient and costly. But solar-powered pumps have changed the game, allowing farmers to implement drip and sprinkler irrigation, which conserves water while maximizing crop growth.

#### Case Study: Gayaza farm

Gayaza Farm partnered with Green Power International Limited to install a 1.2 kW solar water pumping system capable of supplying 24,000 liters of water per day. The

result? Consistent irrigation, increased yields, and improved produce quality—even during prolonged dry spells.

#### Other Success Stories

**Kente Farm:** A 1.2 kW solar water pumping system has improved milk yields and animal health.

#### Conclusion

Switching to solar-powered water pumping isn't just a trend—it's a necessity. Solar-powered water pumping is more than just a technological advancement—it's a transformative opportunity. As Uganda continues to develop its agricultural sector, embracing renewable energy solutions like solar water pumping will be crucial in

building resilience against climate change and fostering sustainable growth.

While the initial investment may seem high, the long-term savings and increased farm output far outweigh the cost.

**Are you ready to transform your farm? Green Power International Limited provides expert installation and support, helping farmers harness the sun's power to secure their agricultural future.**



# How regenerative grazing balancing livestock and conservation in Buikwe District while restoring land and livelihoods

BY ISIAH LWALINDA

## Introduction

**R**egenerative grazing is an eco-friendly land management practice designed to improve soil health and ecosystem functionality through strategic livestock rotation and pasture use. It involves dividing pastures into smaller paddocks, allowing high stocking rates for short grazing periods followed by rest periods that let the grass recover (Marek, 2022). This approach, part of regenerative agriculture, focuses on soil vitality restoration, enhancing biodiversity, and conserving natural resources while providing numerous environmental benefits such as carbon sequestration and biodiversity restoration (Williams, 2022).

## Regenerate Africa's role in promoting Regenerative Grazing

Regenerate Africa, a non-governmental organization based in Uganda, aims to transition Africa to a regenerative economy by promoting sustainable agricultural and land-use practices. The organization works closely with communities, governments, industries, and other stakeholders in collaboration with development partners (including: Rapid Advisory, GAIA initiatives, Preston Werner Ventures, Population Institute, and Panorama Global) to foster inclusive, regenerative solutions for food security, climate resilience,

renewable energy, and ecosystem conservation. One of Regenerate Africa's initiatives includes a demonstration farm in Nalumuli, Zitwe Parish, Ssi Bukunja sub-county, Buikwe District, where regenerative grazing practices are being actively promoted at the demonstration farm and the wider community in the immediate landscape.

The landscape around the farm covers the Ssi Bukunja sub-county, Buikwe district in Central Uganda, one of the few areas in the greater Mukono region that still has substantial natural forest cover, much of which is managed through assisted natural regeneration. The forest, spanning 1000 hectares, is home to over 300 species of birds and various medicinal plant species. Through regenerative grazing (involving management of over 200 heads of cattle), Regenerate Africa has seen improvements in soil health, biodiversity, and the restoration of indigenous tree species, as well as positive results in water management and carbon storage in the above and below ground biomass.

With due consideration that the community needs are many and that the promotion of regenerative grazing does not address all the community needs (i.e. food security, access to health/sanitation and family planning services), Regenerate Africa applies a holistic and multi-sectoral development

approach through application of the Population, Health and Environment (PHE) concept. In addition to regenerative grazing, Regenerate Africa also promotes banana-coffee-agroforestry. Through this, additional interventions were integrated and implemented with regenerative grazing to address other community needs. Thus, the interventions implemented included: a) Training and support for application of agroforestry, especially growing banana, integrated with coffee and indigenous trees (such as Musiizi i.e. *Maesopsis eminii*, also planted along the land boundaries), and livestock i.e. cattle, goats, sheep and piggery; b) Awareness creation about family planning and support for access to family planning services, through community outreach programs; c) Trainings on hygiene and sanitation (Nakalanda, 2023); d) Training and support for access to improved vegetable seeds for establishment of kitchen gardens at household level; and e) Facilitated community engagements for development of Ssi Bukunja sub county bye law for advancing food security and sustainable environment and natural resources management.

Overall, these additional interventions added positive attributes to community livelihoods in respect to improved food security; nutrition; increased household incomes; better health and sanitation; environment conservation and management; and climate change adaptation among

500 households in Ssi-Bukunja sub county.

### Emerging issues

Despite its clear environmental and economic benefits, several challenges hinder the broader adoption of regenerative grazing:

a) Farmer Resistance: Many farmers hold negative attitudes toward regenerative grazing, which can be mitigated through awareness campaigns and skills-building initiatives;

b) High Initial Costs: Setting up a regenerative grazing system requires significant investments in infrastructure like fencing, water systems, and grazing management tools. This financial barrier is particularly challenging for smallholder farmers.

c) Water Scarcity and Drought: While regenerative grazing can enhance soil water retention over time, water scarcity and inadequate infrastructure are persistent issues, particularly in drought-prone regions.

d) Long-Term Commitment: The benefits of regenerative grazing are not immediate, and farmers may be discouraged by the slow pace of improvement in soil health and pasture quality.

Despite these challenges, there are emerging opportunities, such as:

i) Niche markets for regenerative and organic products, along with agri-tourism opportunities, offer potential financial incentives.

ii) Additionally, linkages for access to carbon credits from the carbon stored in biomass and avoided greenhouse gases present another opportunity for additional income, as incentives for efforts in application of Regenerative grazing.

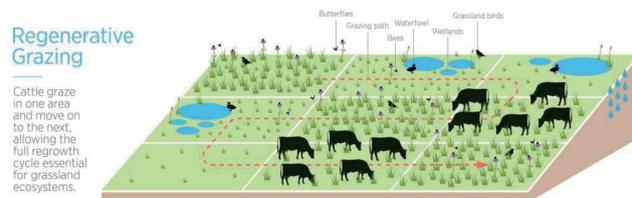
### Key recommendation for implementation of Regenerative grazing to scale

- To facilitate the adoption of regenerative grazing, farmers are encouraged to start small and gradually scale up their operations. Even a small herd can significantly contribute to improving soil health through manure. Using cost-effective methods, such as live fencing with thorny shrubs and creating water corridors, can help reduce infrastructure costs.
- Targeted training is crucial for farmers to fully understand regenerative grazing principles and make informed decisions about implementation. Additionally, upfront investments in carbon credit assessments can be offset by advance payments from carbon credit buyers, making it financially feasible for farmers to participate in carbon credit markets.
- Agri-tourism and access to carbon credits should be pursued to incentivize regenerative grazing to contribute towards transformation and sustainability at different scales i.e. community, local, national and international.

In conclusion, Regenerative grazing holds considerable potential for improving environmental health, biodiversity, and carbon sequestration while fostering economic resilience in rural communities. Regenerate Africa's initiatives in Uganda have demonstrated tangible benefits, including land restoration and improved climate resilience. However, the successful adoption of regenerative grazing depends on overcoming challenges such as initial costs, water scarcity, and long-term commitment. Through further training, action research, and support for infrastructure, farmers can surmount these barriers, contributing to a more sustainable agricultural system. Regenerate Africa aims to scale up its efforts to reach more livestock keepers in Uganda's cattle corridor, leveraging research, training, and policy engagement to promote broader adoption of regenerative grazing practices.

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An infographic about Regenerative Grazing. NET PHOTO

<p><b>DIVERSE HABITAT</b> Regenerative grazing enhances habitat diversity, which benefits birds, pollinators, and other wildlife.</p>	<p><b>CARBON SEQUESTRATION</b> Plants capture atmospheric carbon most efficiently during the regrowth process.</p>	<p><b>CLIMATE RESILIENCE</b> Healthy soils with deep roots hold more water and can withstand droughts.</p>
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# Rabbit Production in Uganda: Potential Versus Opportunity

BY DR. SABENA GERALD (BVM, MAK)



In only the past ten years, meat rabbit production in Uganda has been actively promoted by enthusiasts, via the “Rabbit Craze,” as a get rich quick business opportunity with unlimited potential markets, both domestic and abroad. In Kampala, the infantile rabbit industry can be described as a semi-intensive, commercial production system based on high costs of investment (breeding stock, shelter, food and labour) and non-realized profitability.

Further, purebred seed stock producers sell animals at exorbitant prices (shs. 25000- 70,000) and feed companies sell pelleted feed at high prices (shs. 4000 per kg). This business exploitation invariably forces commercial rabbit producers to sell fryers at light market weights (about 2kg) in an attempt to recover business costs. In turn, wholesalers typically double market prices, which further inflate consumer costs at sh. 4,000-5,000 per kg. These consumers are mostly expatriates or “uptown people” as they are commonly referred to. As expected, many commercial producers have lost money, abandonment rate has been high and the present reputation of rabbit production is waning.

Paradoxically, real opportunities exist in Uganda to foster development by assisting needy families through grassroots level, village based rabbit program. Rabbits can benefit many families, nutritionally and economically, in less time than many other livestock

projects and at lower investment costs, but only if a sound project plan is implemented. This can be done through economic incentives to encourage rabbit production, farmer awareness programs to enlighten them about standard feeding, housing, biosecurity (disease prevention) and treatment plus market development. The initial management of limited pilot projects should foster the gradual development of rabbit meat consumption in villages as a short-term goal and expansion of formal markets for rabbit meat as a long-term goal.

## The Present dilemma

Rabbit meat consumption is not a traditional practice of Ugandans. LUZOBE (1997) reported that only 35.5% of Ugandans have ever consumed rabbit meat. Although taboos influencing the acceptance of consuming rabbit meat do not appear to be a major concern, one common prejudice is the resemblance of rabbits to rats. In Tororo district, a taboo was learned that, “if a pregnant woman eats rabbit meat, the baby will be born with long ears” In Kampala, while there are probably hundreds of rabbit producers still in the business, claims were made that some producers are now simply handing rabbits to children to keep as pets. Further, it is claimed that producers do not know how to properly process a rabbit fryer. Preparation usually involves only boiling the meat in water without the addition of vegetables or spices, only to experience that the meat is bland upon serving, which obviously

contributes to poor acceptance.

## Suitable Breeding stock

In Uganda, the genetic quality of breeding stock is generally adequate. On farms where proper feeding and management practices are evident, reproduction and growth is always satisfactory. The need to import unrelated lines of exotic breeds (e.g., Californian, New Zealand White) to offset inbreeding depression and increase performance is not justified. Moreover, crossbred stock produced on small farms are commonly saved as herd replacements, as opposed to the purchase of expensive exotic breeds.

## Feeding

A visit to an ordinary farm would reveal the use of mostly sweet potato vines as a forage (Crude protein of about 4%) yet growing rabbits require about 16% cp; LEBAS et al., 1997). Few farmers feed legume forages to their rabbits yet energy levels also appear to be lacking in the diets.

The following are some of the suitable local foodstuffs for rabbits and the recommended feeding practices.

## Suitable local foodstuffs for rabbits in Uganda

**Legume forages:** Calliandra, Desmodium, Lablab, Leucaena, Pigeon pea, Sesbania

**Grass forages:** Bracharia, Elephant

Continued on Page 26 ▼

# The Implementation of 14 Valley Tanks under the MOBIP Project

## Introduction

In a significant step toward addressing water scarcity and enhancing agricultural productivity, Uganda's Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF) has successfully implemented the construction and rehabilitation of 14 valley tanks under the *Developing a Market-Oriented and Environmentally Sustainable Beef Meat Industry in Uganda (MOBIP)* project. Funded by the European Union and the Government of Uganda, this initiative aimed to bolster the country's agricultural sector, improve food security, and create sustainable livelihoods for rural communities particularly in Disease Control Zones (DCZs) 1 and 2.

## Project objectives and scope

### Key objectives

The primary objectives of the valley tank construction and rehabilitation include:

1. **Ensuring reliable water supply:** Providing a consistent

water source for livestock and agricultural activities, particularly in drought-prone areas.

2. **Mitigating drought effects:** Offering a sustainable water solution to combat the adverse effects of climate variability.

3. **Community capacity building:** Enhancing the ability of local communities to manage and maintain water infrastructure through the formation of Water User Associations (WUAs).

4. **Promoting equitable access:** Ensuring fair distribution of water resources to support both livestock and domestic needs.

Each valley tank was designed with a minimum capacity of 10,000m<sup>3</sup>, benefiting farmers across 14 districts, including Kayunga, Kiboga, Kiryandongo, Lwengo, Lyantonde, and others.

The 14 valley tanks are equipped with several key components to maximize their utility:

- **Valley tanks:** The main water storage structures, with capacities

of 10,000m<sup>3</sup> or 20,000m<sup>3</sup>.

- **Overhead water tanks:** Reservoirs to store and distribute water.

- **Cattle troughs:** Designed for livestock watering.

- **Solar abstraction systems:** Hybrid systems powered by solar and hydroelectricity to pump water.

- **Pump houses:** Facilities to house the pumping equipment.

- **VIP latrines:** Two-stance latrines to improve sanitation.

- **Fencing:** Protective barriers to secure the tanks and surrounding areas.

The scope of work encompassed the identification and assessment of suitable sites, excavation and construction of new tanks, rehabilitation of existing ones, and installation of essential infrastructure, such as cattle troughs, solar-powered water pumps, and storage reservoirs. Additionally, training was provided to Water User Associations (WUAs) to ensure the sustainable management of the facilities.



An excavator at one of the valley tank sites. FILE PHOTO



The project was implemented by the Department of Agricultural Infrastructure, Mechanization, and Water for Agricultural Production (DAIMWAP) under MAAIF, with supervision from the MOBIP Project Management Unit (PMU) and the Department of Water for Production (DWfP) in the Ministry of Water and Environment (MWE).

**Project cost and stakeholder engagement**

The total project investment amounted to UGX 5.96 billion, covering construction, monitoring, training, and supervision costs. Stakeholder consultations played a crucial role in project implementation, involving local government officials, sub-county representatives, community leaders, and landowners. These engagements facilitated community mobilization and integration of gender-sensitive considerations into the project design.

**Construction phases and methodology**

The project was executed in three phases:

- **Pre-construction phase:** Site assessment, mobilization of equipment, and community sensitization.
- **Construction phase:** Excavation, embankment formation, installation of water abstraction systems, and construction of project structures, including pump houses and latrines.
- **Demobilization phase:** Site cleanup and final inspections to ensure compliance with environmental and engineering standards.

To maintain quality, rigorous engineering assessments were conducted, including geotechnical tests to ascertain soil suitability. Embankments were compacted to prevent leakage, and cut-off trenches were constructed to minimize seepage losses. Vegetation was planted on embankments to prevent erosion, and communities were trained in maintenance practices.

**Challenges and mitigation measures**

Despite the project's success, challenges were encountered, including unpredictable rainfall delaying construction, inadequate community cooperation, and stray animals accessing the unfinished sites. To address these issues, project implementers enhanced community sensitization efforts, reinforced site security, and adjusted construction schedules to mitigate weather-related delays.

**Impacts and sustainability**

The construction of valley tanks has significantly improved access to water for livestock and agricultural use, reducing reliance on erratic rainfall patterns. This initiative aligns with Uganda's Vision 2040, the National Development Plan III, and the National Irrigation Policy by enhancing water storage for production purposes. Additionally, it contributes to the achievement of Sustainable Development Goal 6 (Clean Water and Sanitation) by providing safe and equitable access to water resources.

Economic benefits have also been realized, including job creation during the construction

phase and improved agricultural productivity due to reliable water supply. Future sustainability depends on continued stakeholder engagement, routine maintenance, and effective management by Water User Associations.

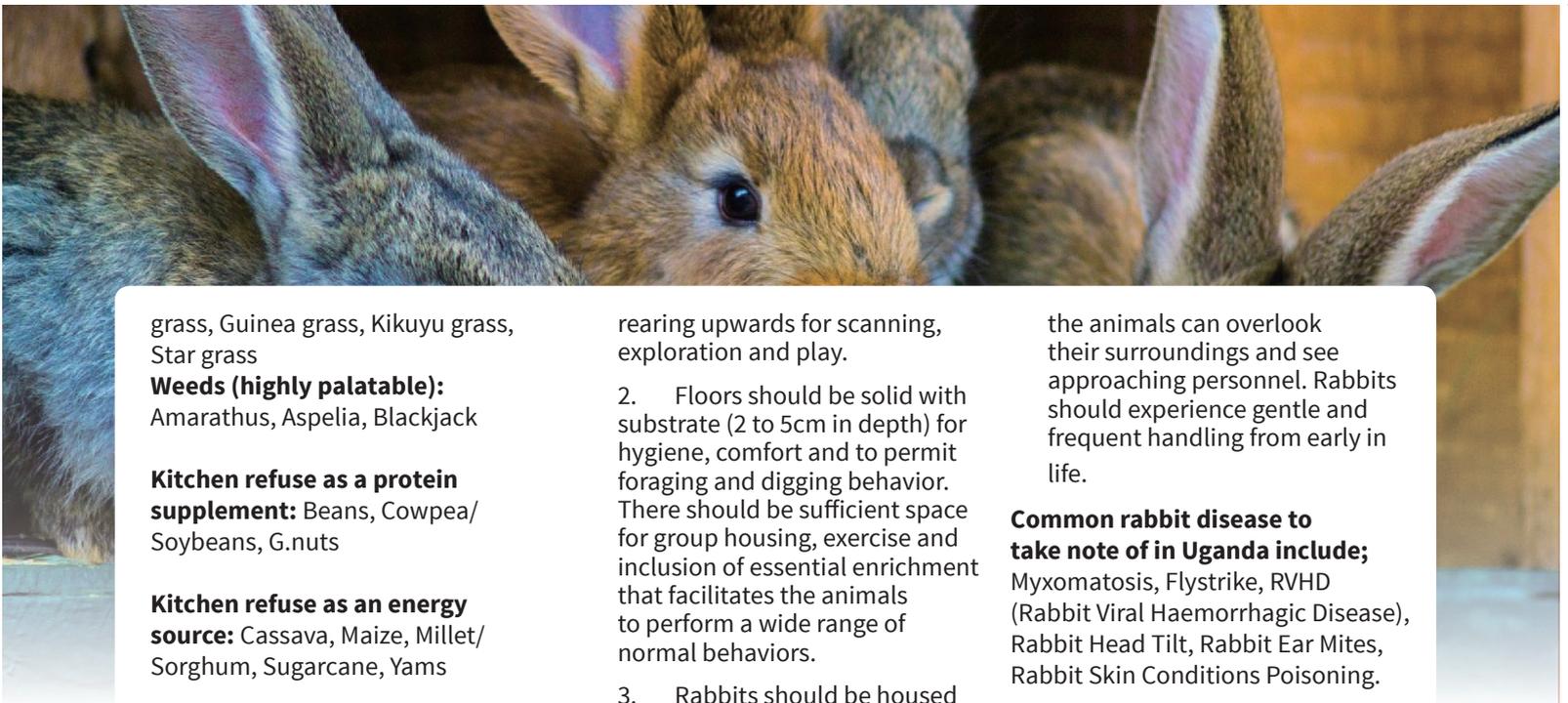
**Looking ahead**

The MOBIP project represents a significant step forward in Uganda's efforts to build a resilient and sustainable agricultural sector. By addressing water scarcity and promoting community-led water management, the project not only supported livestock and agricultural activities but also contributed to broader national goals, including the Uganda Vision 2040 and the National Development Plan III.

The focus has shifted to ensuring their long-term sustainability through continued community engagement, regular maintenance, and capacity-building initiatives. The success of this project could serve as a model for similar initiatives across the region, offering a blueprint for addressing water scarcity and enhancing agricultural productivity in arid and semi-arid areas.

For more information on the MOBIP project and its impact on Uganda's livestock and agricultural sectors, look through the past Ishaazi Livestock Magazine issues.

*This article is based on the "Technical Implementation Report for the Construction of 14 Valley Tanks" prepared by the Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF), Uganda.*



grass, Guinea grass, Kikuyu grass, Star grass

**Weeds (highly palatable):**

Amarathus, Aspelia, Blackjack

**Kitchen refuse as a protein**

**supplement:** Beans, Cowpea/ Soybeans, G.nuts

**Kitchen refuse as an energy**

**source:** Cassava, Maize, Millet/ Sorghum, Sugarcane, Yams

**Fruits:** Avocado, Banana, Jackfruit, Mango, Passion fruits

**Recommended daily feeding practices for village-scale production**

- Harvest legume and grass forages from established plots
- Feed 1/3 protein forages to 2/3 other forage sources (grass and weeds)
- Offer at least five forage species in each of the two daily meals
- Tie forages in bundles and hang from top of hutch, or use racks
- Utilize kitchen wastes daily to reduce feed costs
- Feed surplus fruits and vegetables
- Place feed supplements in feeders to prevent wastage
- Remove non-consumed feed after 12 hours to prevent contamination
- Provide fresh water at all times in spill proof containers
- Supply a source of salt

**Other guiding principles in rabbit keeping.**

1. Housing in pens on the floor should always be considered before cage housing. Where cage housing is used an elevated platform should be provided. Pens should be large enough for animals to hop, jump and make quick changes of direction. Pens should have sufficient height for

rearing upwards for scanning, exploration and play.

2. Floors should be solid with substrate (2 to 5cm in depth) for hygiene, comfort and to permit foraging and digging behavior. There should be sufficient space for group housing, exercise and inclusion of essential enrichment that facilitates the animals to perform a wide range of normal behaviors.

3. Rabbits should be housed in stable, compatible groups, established with immature animals of the same age and sex, as soon as possible after weaning. Entire male rabbits should be separated from other males at sexual maturity (12 to 14 weeks) and housed individually with visual and olfactory contact with other rabbits.

4. Breeding females should be provided with nest boxes containing nesting material, that are designed so that littering does not see each other to minimize the risk of infanticide. Rabbits should have a raised area to make use of the vertical space, offer a comfortable resting place and refuge, stimulate exercise and offer a choice of microenvironment.

5. Hay should be provided for foraging, play, nest building, and for a varied diet. Rabbits should always have access to something to gnaw (e.g. wooden blocks) for enrichment, chin-marking and to prevent the teeth from overgrowing.

6. Visual barriers should be provided to allow the animals to initiate or avoid social contact. Rabbits should have access to substitute burrows (e.g. plastic crates, sections of appropriately sized PVC pipe) for retreat in fear-provoking situations and to manage social interactions.

7. There should be good visibility out of the pen (e.g. mesh or plastic wall) so that

the animals can overlook their surroundings and see approaching personnel. Rabbits should experience gentle and frequent handling from early in life.

**Common rabbit disease to take note of in Uganda include;**

Myxomatosis, Flystrike, RVHD (Rabbit Viral Haemorrhagic Disease), Rabbit Head Tilt, Rabbit Ear Mites, Rabbit Skin Conditions Poisoning.

**Market Development strategies**

One noteworthy market development association i.e. the Uganda Rabbitry Development Association (URDA) has conducted a market survey previously (KAYONGO, 1996) and written a number of rabbit production manuals. In each of the designated manual reports, it has been recommended that rabbit meat should be first consumed regularly by the farmer's family. In other words, the market demand begins at home. Once production is increased, and the family is consuming 1-2 fryers per week, surplus fryers may largely be sold (or provided as an in-kind loan) as breeding stock to encourage the neighbors to embark upon rabbit farming. Some of the initial surplus can also be sold to associations like URDA that have a better access to a bigger market at competitive prices. It should be noted that affordability of fryers is an important step in rabbit farming development contrary to exorbitant prices that would be counterproductive to the development process of the industry.

In conclusion, opportunities for small scale-scale rabbit farming projects can be truly more than mere potential.

*The writer is a Technical Sales Representative at Global Vet (U) Ltd.*



# Poultry: Layer Farming

BY DR. WESLEY RUTTO  
Managing Director, Kukuchic

**K**ukuchic is a poultry breeding Company in Uganda specialized in breeding and hatching of birds, sales of quality day old chicks and its distribution.

Kukuchic has 4 breeder farms, hatchery and feed mill located in Nakaseke. We have an experienced and dedicated team that ensures production of quality day old chicks. The farm has instituted proper biosecurity mechanisms to ensure that farmers get disease free birds. Kukuchic has 3 main chick products:-

Cobb 500 broilers  
Isa Brown Layers  
Rainbow roosters (Dual purpose birds)  
In this article we will talk about Layer farming.

Layer poultry farming means raising poultry birds for the purpose of commercial egg production. Layer chickens are such a special species of hens, which need to be raised

from when they are one day old. They start laying eggs commercially from 18-19 weeks of age. They continue laying eggs continuously till their 72-80 weeks of age.

According to the nature and colour of egg, layer hens are of two types. Short descriptions of these two types are listed below.

### White Egg Laying Hens

This type of hens is comparatively smaller in size and the colour of the egg shell is white. Dekalb white, Lehman White, Nikchik, Bab Cock BV-300, Harvard White, Hi Sex White, Sever White, Hi line White, Bovanch White etc. are some popular white egg laying chickens.

### Brown Egg Laying Hens

Brown egg laying hens are larger in size. They eat more food, compared to white egg layers. Lay bigger eggs than other laying breeds. The egg shell is brown coloured. They are the most popularly kept birds in Africa. There are many types of brown layer available. Among those Isa Brown, Hi Sex Brown, Sever 579, Lehman Brown, Hi Line Brown, Bab Cock BV-380, Gold Line, Bablona

Tetro, Bablona Harko, Harvard Brown etc. are very suitable for commercial layer. In Kukuchic we sell Isa Brown Layers this is because of their adaptability to the local environment and persistency in production/laying.

In managing layers, the following are key to ensure farmers achieve the best out of them.



### 1. Genetics

Different breeds or strains of birds have different characteristics: body size, growth rates and production levels and will absorb and utilize nutrients from feed with different levels of efficiency. Farmers should ensure they source good quality, disease free birds and should work with reputable companies with good breeds to ensure success.

### 2. Housing

There are a lot of factors that determine the effectiveness of a

poultry housings system; factors such as ventilation system, flooring system, building insulation and fencing etc. Once a poultry farmer is able to get it right with the poultry housing system, then he can be rest assured that he wouldn't spend much when it comes to combating predators, disease causing organism and even unfavourable climatic conditions. The essence of a good poultry housing system is to minimize the cost of running your poultry farm and to maximize profits in the business. Proper spacing of the birds is vital in housing.

There are 2 main systems commonly practised in Africa for layer rearing i.e. Deep litter and battery cage systems.

For **Deep Litter system** (common in Africa) a density of 6 layers per square meter is recommended. Proper litter management is important to avoid wet litter which could lead to microbial infections.

We also have the **battery cage system**. The cage system of rearing birds has been considered as a super intensive system providing floor area of 450-525 sq.cm. (0.6-0.75 sq.feet) per bird. In cage the birds are kept in one, two or three per cage, arranged in single or double or triple rows.

**3. Nutrition**

In layer farming feeding and weight management during rearing and production is paramount. To achieve desired weights, nutrition is key. Farmers should feed their birds with properly formulated diets for the different stages of birds i.e.:-

- Chick Mash- Day 1- Week 6
- Growers Mash- Week 6- Week 17
- Pre layer- Week 17- 5% production/ lay
- Layers Mash 1- 5% production- 45

weeks age  
Layers Mash 2- 45 weeks age to offlay.

It is also important to note that the weight of birds is key to stimulate onset of laying. For Isa Brown layers they begin laying with weights of 1,500- 1,600 Gms (1.5- 1.6Kgr). This means if the birds are not managed well and by 18- 19 weeks they don't attain these weights they will not start laying.

Kukuchic is working with Nuscience to ensure that farmers get proper feeds for the different stages of the birds by using **VITAMEX concentrate**.



**4. Health**

The health of the birds is key and farmers should ensure they institute proper biosecurity mechanisms and also preventive measures e.g. Vaccinations to ensure that they have flocks with good immunity to prevent outbreaks of diseases.

Proper consultation and advise from visiting Vets is also key for proper diagnosis and treatment incase of diseases.

**5. Management**

Proper management of flock and the following required to achieve

desired targets:-

- Stocking densities
- Lighting
- Heating (Brooding temperatures)
- Feeds and feeding
- Poultry equipments

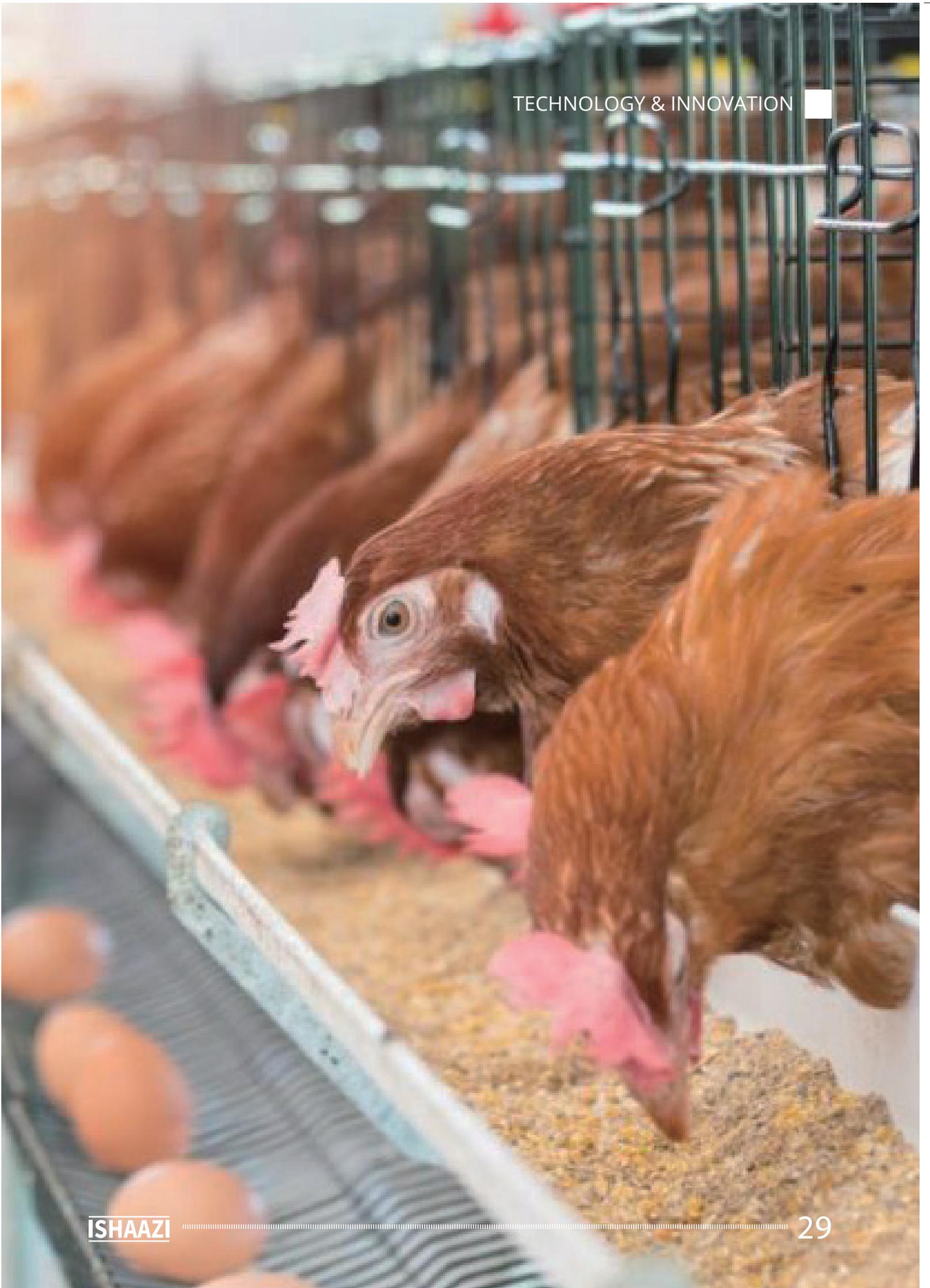
Spending time with your birds daily is very important and helps you observe abnormalities so that early interventions can be done for the birds to avoid losses due to diseases and mortalities.

Regular weighing of birds (weekly) and comparing the actual with the standard is key in managing your flocks. Farmers should also grade the birds (if possible at week 2, week 6 and week 10). The smaller birds to be kept in one pen, medium other and larger birds in different pen so as they compete favourably for feeds and water. If this is done effectively uniformity is easily achieved.

To be successful you must understand the circle from acquiring chicks through to the time they start laying eggs. Knowing the importance of brooding, lighting and temperatures; diseases, vaccination and so on are also critical.

Have a proper business plan, no matter how simple you begin, to be sure about what you require; your projections of what to expect and when you expect to break even and start making profits.

Keep proper records of stocks, feeds, vaccination, mortality, weight, sale of birds and eggs, and other expenses.





# Unlocking genetics potential to pig breeding

**BY NICKSON KAGANDA MAGEMBE FRANCIS**

*Pig farming Consultant*

## PIG BREEDS

**P**ig breeds are categorized into two groups i.e. maternal lines and terminal/paternal lines. Each of this category has its own unique characteristics and roles. In pig farming, we base on these unique roles to select pigs for;

1. Breeding
2. Fattening

**Maternal lines** are selectively bred to have motherly characteristics such as;

- High sow milk production
- 16 teats on average and motherly instincts
- Farrow large litter sizes
- Show strong estrus signs
- Wean numerous, heavy and

homogeneous piglets.

Therefore this makes these breeds to be reproductively and productively sound as a breeding herd. Globally, there are 2 known maternal lines produced by different genetic companies i.e. large white and landrace. In Uganda, we can now access these grandparent maternal lines in liquid form (semen) from Brinas development services limited. These grandparent (GPs) were imported from Choice Genetics Company, France. The large white and landrace are branded as M3 and M6 respectively.

It should be borne in mind that pure lines / grandparents cannot perform better alone unless crossbred to capitalize on **heterosis**. Therefore these grandparents are crossbred to produce maternal hybrids/ first filial generation gilts (F1s) and constitute 50% large white and 50% Landrace. These hybrids F1s are great mothers that are crossed with terminal boar lines to produce F2s that are slaughter pigs. Example of a maternal hybrid is CG36 from choice genetics company and Camborough from Pig Improvement Company.

**Terminal/paternal lines** are selectively bred to capitalize on;

- Low feed conversion ratio (FCR),
- Increased growth rate
- Excellent average daily gain
- Excellent carcass/ meat quality
- Vigorous piglets
- High killing out percentage (KO %)



## HEALTH & NUTRITION

Therefore offspring of these terminal boars grow faster and are supposed to be fattened and slaughtered. Their motherly performance can't match that of the maternal hybrids in case someone keeps them for breeding. Globally, different breeding companies brand their terminal boar lines differently. In this case I will mention terminal lines from Choice Genetics Company since they are easily accessible in liquid form (semen) in Uganda through Brinas Development Services Limited. These include Duroc (branded as P26), Pietrian (branded as P81) and synthetic boar (branded as P90)

### SPECIAL NOTES

- Use the right breeds for the right purpose for you to unlock its genetic capabilities.
- In case one can't afford maternal hybrids (F1s), they should grade up using maternal Grand Parent semen to improve their breeding herd.

### PIG BREEDING

There are basically 2 forms of breeding in pigs i.e. natural mating and artificial insemination. All these forms have their merits and demerits. However in this article we are going to dwell on the economics point of view i.e. the unit cost of producing a piglet with respect to Natural mating and Artificial insemination.

### Assumptions

3. The boar on farm is of the same genetic makeup as the boar from which semen is collected.
4. A farmer does pig artificial insemination by herself on farm
5. Farmer does double insemination
6. It's a 10 sow farm
7. Average litter size is 12
8. The sows farrow 2.4 times a year
9. Working lifespan of the boar is 24 months

### Artificial insemination vs. natural mating

Artificial Inseminations	Amount (Ugx)	Natural Mating	Amount (Ugx)
Cost per dose of semen	35000	Boar purchase	9,500,000
Transport to your farm	15000	Working lifespan	24 month
Cost per single insemination	50000	Thus purchase cost per year	4,750,000
Cost per double insemination	85000	Feeding cost for a boar on the farm	1,233,700
<b>Total cost in a year</b>	<b>2,040,000</b>	<b>Total cost of buying and feeding a boar</b>	<b>5,983,700</b>
10 sows farm		10 Sows farm	
Insemination per year	24	Copulation frequency per year	24
Cost per insemination	85000	Cost per service	249,320.833
Average litter size	12 piglets	Average litter size	12 piglets
<b>Cost per piglet with AI</b>	<b>7083.3</b>	<b>Cost per piglet with natural mating</b>	<b>20,776.7</b>
For 5 Sows farm	7083.3	Cost per piglet with natural mating	41,553.4
For 3 Sows farm	7083.3	Cost per piglet with natural mating	69255.787

### CONCLUSION

From the table above, it clearly indicates that the cost of producing a piglet with respect to artificial insemination is quite lower (Ug Shs. 7,083.3) than using natural mating (not less than Ug Shs. 40,000).this therefore makes artificial insemination cheaper option.

# Rearing goat kids away from their dams

BY DR. SABENA GERALD  
(BVM, MAK)

**G**oats may have been the first farmed ruminant species, having been domesticated approximately 10 000 years ago. They are a versatile species, adaptable to many environmental conditions, since their domestication have become popular across the globe.

The global population was estimated to stand at over one billion in 2018, an increase of 15.9% over a 10-year period (Food and Agriculture Organization of the United Nations (FAOSTAT), 2020).

**Globally, milk-producing goat numbers have increased by 20.6% from 2008 to 2018 (FAOSTAT, 2020).**

Despite an estimated global goat population of over one billion, little is known about methods being used to feed milk to artificially reared kids (reared away from their dams) and how kids are weaned from these systems. This can be attributed to the scarce documented information about the characteristics of goat production systems and the welfare of the animals within them, either regionally or globally.

The milk feeding stage and weaning transition are considered high-risk periods for young ruminants, with the

highest mortality occurring in these first months of life (Buddle et al., 1988; Todd et al., 2019). During the milk feeding stage, young ruminants digest milk in their abomasum and to be successfully weaned must develop a functioning rumen capable of microbial fermentation, which is a large physiological change. Rumen development is linked to the ingestion of solid feedstuff, and low consumption is correlated with slower rumen development and subsequent weight loss post weaning (Sweeney et al., 2010).

Under natural conditions, weaning would take place over an extended time frame involving a gradual reduction in the intake of milk and contact with the dam (Bungo et al., 1998) alongside increasing solid feed consumption weaning from artificial milk supply systems cannot incorporate these natural cues and can cause responses indicative of stress. Therefore, weaning management in commercial systems is an important potential welfare issue. Yet, the prevalence of different goat kid-rearing systems and the development of optimized young stock husbandry practices have garnered limited attention.

Weaning (nutritionally; the process of transitioning from a milk-based diet to one composed of solid feedstuff) represents an important transitional phase of management. Whilst early weaning may be desirable in terms of management (including reducing labor and feed costs), timing weaning

correctly is essential to animal welfare. There is increasing evidence from cattle that early high growth rates have long-lasting impacts beyond the milk feeding and weaning period. Higher early growth rates result in higher BW at 24 months of age, increased milk yields and reduced age at first calving.

Successful weaning (without significant morbidity and mortality) of goat kids has been documented at 5 weeks of age providing they were consuming at least 30 g of solid feed daily preweaning. The consumption of solid feed may be an important consideration in determining optimal weaning times, however, unlike in many calf operations, the technology able to monitor individual intakes is generally not used when rearing goat kids; therefore, weaning strategies tend to be based on easy to measure traits such as weight or age.

Greater understanding of on-farm management can ensure research aimed at improving goat welfare is relevant and applicable to the various systems employed, and the scale and objectives of those systems. Whilst bottle feeding is the most common milk feeding method, followed by ad libitum systems. Kids are significantly more likely to be abruptly weaned from ad libitum milk feeding systems, or gradually weaned from bottle feeding. Evidence suggests that gradual weaning has welfare and production advantages over abrupt weaning, more information on weaning strategies for ad libitum milk systems is still needed.



# The Role of the Farmer in **Correct Diagnosis and Prevention of Disease on the Farm**

BY DR. KALULE FRANCIS

**R**ecognition of disease is the foundation of disease control and prevention on a farm. And it all starts with the eye of the farmer: nobody knows the animals better as the farmer.

For example; when milk production of the best cow drops, or when the chicks have swollen eyes, or maybe they did not eat so well? A good farmer is an observer and when something is wrong on the farm, he should call his vet.

Your vet should be the expert to find out what's happening on the farm. Most of the time the vet needs to rely on what he/

she sees: that's called clinical diagnosis. But sometimes the vet will need to take a sample from the diseased animal and send it to the lab to confirm his opinion or to exclude some diseases. And therefore, you need a good lab, well trained and experienced lab technologists and a strong advice from your vet based on the lab result.

Most of the times the practice is that, farmers rush to treat their animals and this has contributed to misuse of drugs leading to multi-drug resistance through "trial and error" with the animals hence causing poor animal productivity and often loss of animals.

Farmers play a key role in the disease prevention cascade and

should facilitate use of the vet labs to aid in disease diagnosis by referring their sick animals to their vets who can then take off samples in a timely manner and do timely interventions. This will improve animal productivity and livelihoods and demonstrate return on investments for the farmer.

Accurate information to your Vet is key.

**Disease recognition is a two-way process, involving forward and backward flows of information. The forward flow begins with the farmer, passes through the veterinary**

**practitioner and ends in the diagnostic laboratory, while the backward flow follows the same steps in reverse direction.**

Once the laboratory has received specimens and information from the submitting veterinary practitioners or animal owner, it is the laboratory technician's duty to ensure that adequate information is gathered that will help in selection of the most appropriate testing procedures. The more reliable the information you give to the vet and the lab, the better the final diagnosis and the solution for your farm. Hiding crucial information as starting date of first signs of sickness or previous treatments of the animal by yourself will not help. Be honest in answering the questions your vet is asking.

Just like in human medicine, where you are requested to give history and onset of signs of disease or self-treatment. In most cases you hurry to respond because you want to recover, it is not different in animal health and it matters a lot when you say the all truth about your animal because then it becomes easier for your vet to handle the case and aid diagnosis.

**The Role of Veterinary labs in improving animal health**

The biggest challenge veterinary practitioners face in being able to recognize diseases in

developing countries like Uganda and there is lack of diagnostic labs. Indeed, there is a saying that "if you do not look for it you will not find it." In addition to poor access to diagnostic labs, one of the main reasons why certain diseases may go unrecognized for long periods is the failure to suspect their possible occurrence.

The bottom line for effectiveness in playing the disease recognition role is that correct samples using correct sampling techniques should be submitted to the laboratory and results should be released on time and this also means that there should be a network of fully functional laboratories in the country playing a key role in disease recognition.

The African Livestock Productivity Health Advancement initiative (A.L.P.H.A) of Zoetis has a mandate of ensuring that not only functional laboratories are put in place in the different regions, but that they are equipped and that the lab personnel are fully trained; the vets are fully aware of proper sampling and indeed that the farmers (animal owners) realize full value for their investments.



The lab technician's role in disease surveillance should lead him to:  
1. Notice and report abnormal disease patterns (steep rises or declines); and  
2. Select and test for emerging diseases that the submitting veterinarian might not have suspected.

**Now that the labs are in place and closer to the farmers, full utilization of these Zoetis - ALPHA funded laboratories by both small holder farmers and their veterinary practitioners in Uganda and Sub-Sahara Africa will contribute to proper management of diseases and help in combatting the emerging zoonotic diseases on time.**



A veterinarian doctor diagnosing a sick cow. NET PHOTO

# Climate Smart Hydroponics: Green Fodder Technology for Zero Grazers

BY DR JOLLY KABIRIZI

**S**mall-scale dairy production plays a crucial role in food security, human health and overall household livelihoods, particularly among climate change-prone resource-poor households in Uganda.

Zero-grazing dairy cattle production system is increasingly being promoted, owing to shortage of grazing land and intensive dairy production requirements. Zero grazing dairy cattle production system is important for milk production which doubles as an important source of protein and income as it is commonly referred to as the farmers' "white gold" in many communities in Uganda. Feeds contribute over 70% of the total cost of production in a profitable zero grazing dairy cattle enterprise in Uganda. Pastures and forages are the most important single source of feed (nutrients) for dairy cattle. Climate change projections for Uganda indicate increasing temperatures, changes to rainfall patterns, and elevated atmospheric carbon dioxide concentrations all of which are likely to affect the productivity of pasture-based dairy cattle systems.

For a sustainable dairy farming, quality green fodder should be fed regularly to the dairy cows, otherwise the productive and reproductive performance of the dairy cows is adversely affected.

The major constraints in production of green fodder by dairy farmers are unavailability of land for fodder cultivation due to small land holding size, scarcity of water, labour required for cultivation (sowing, weeding, harvesting etc.), requirement of manure and fertilizer, more growth time (approx. 60 to 120 days), fencing to prevent fodder crops from wild animals and natural calamities etc. Due to the above constraints in the conventional method of fodder cultivation, hydroponics technology is coming up as an alternative to produce green fodder for dairy cows.

Hydroponic fodder is the livestock feed produced using hydroponics technology, "a **method of growing plants without soil**". Hydroponics or sprouted fodder is tender, young cereal grass grown from grain seeds. It is an equivalent of fresh grass which is considered to be very good dairy cattle feed. Both the grass blades and the root mass are fed to livestock the same day they are harvested. Feeding fresh, green feed has significant nutritional advantages over dry feeds. Different types of fodders such as: **maize, wheat, barley** can be grown using hydroponics technology. Barley is the most popular and has a good germination rate but it is not readily available and is very expensive (Ushs 3,500 per kilo of seed). The choice of cereal



A simple hydroponics maize fodder unit at Kyakuwa Farm, Seguku village, Wakiso district

grain for hydroponics technology depends on the geographical and agro-climatic conditions, easy availability and cost of seeds. The sprouted fodder grows from a dry seed to a 6-7 inch (15-18 cm) tall plant in as little as 8 to 10 days depending on the seed variety and management.

## Construction of Hydroponic fodder system

To grow good quality fodder, you need to be able to control the temperature and humidity. The fodder easily grows in semi-controlled environmental conditions with the temperature range of 15-32°C and relative humidity of 80-85 percent.

Also, control light is needed to

grow fodder, so you need to build a small shed net or a low-cost **greenhouse**.

A little space is required, mostly farmer use 10 ft x 10 ft shade net to grow hydroponic fodder. It is better to choose shed net location near to the zero grazing dairy cattle shade because it becomes easy to operate.

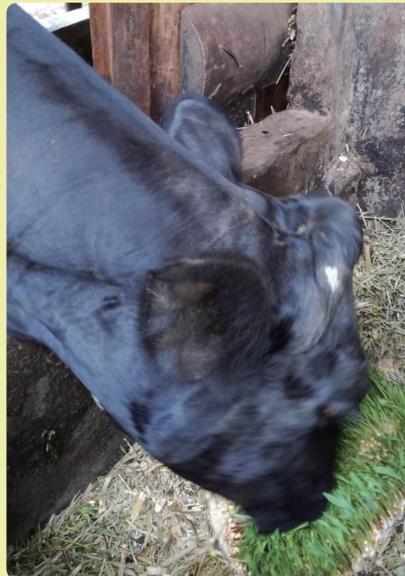
To allow ventilation, leave some open space between the roof and side walls when the shed is well ventilated and airy. This allows you to maintain the temperature and humidity.

You can use timber, iron rods or plastic pipes to make a shed net or a low-cost greenhouse. You need shade netting or gunny bags to cover this structure.

Inside the shed, you can build racks made out of timber or metal to hold these trays.

Make 3 to 4 layers rack but take care the rack should not be too high because it becomes difficult to spray water and to remove the trays.

Keep enough space between two layers so you can easily water the seeds also create slightly slope for each layer to one side of the rack this is helpful for easily and quickly water to drain from the trays.



Zero grazed dairy cows feeding on fodder

Make a small drainage line under the slope side of a rack to properly drain out water.

### The basics of sprouting fodder

Just like sprouting grains for human consumption, growing fodder as sprouted grains is relatively easy – with a rapid turnover from the start to a ready-to-use product. Only untreated, feed grade, whole grain seed should be used for sprouting.

### Seed quality and seed rate

The grain should be clean, not insect infested, untreated, viable and good quality.

The seed rate (quantity of seeds loaded per unit surface area) affects the yield of the hydroponics fodder, which varies with the type of seeds.

Hydroponics maize fodder can be produced with seed rate of 6.4-7.6 kg per square meter.

If seed density is high, there is more chance of microbial contamination in the root mat, which affects the growth of the fodder.

### The basic steps for growing hydroponics fodder are as follows:

- Soak the seeds in clean water until the seed is clean.
- Remove the floating seeds and dirt or sieve.
- Add water and 2 teaspoonful of sterilizer/disinfectant such as JIK in 20 litres of clean water to get rid of pathogens.
- Leave the seeds for 5 minutes and then wash the seed again in clean water.
- After 5 minutes, drain the water from the seeds, wash and rinse the seeds for 2 to 3 minutes.
- Soak the seed again in water for 24hours.



Zero grazed dairy cows feeding on fodder



- Drain water away.
- Spread the well soaked seeds evenly on trays such that the tray surface is all covered with one layer of seeds. Do not put too much seed on a layer as this will affect their germination.
- Water the seeds with clean water every 2 hours to keep the seed and roots moist all the time.

### Germination and maintenance

The starting of germination and visibility of roots varies with the type of seeds. In case of maize, germination start on about 2<sup>nd</sup> day and the roots are clearly visible from 3<sup>rd</sup> day onwards.

Maintenance of clean and hygiene is very much important in the production of hydroponics fodder as greenhouse is highly susceptible to microbial contamination, particularly of mould growth due to high humidity. Inside the greenhouse, generally the grains are allowed to sprout for seven days and on day eight, these are fed to the dairy animals.

### Yield and feeding value of the hydroponics fodder

The yield and dry matter content are influenced by the type and quality of the seed; degree of drainage of free water prior to weighing; and clean and hygienic condition of the

greenhouse.

Dry matter content of 15 to 18 percent is common for hydroponics maize fodder.

A sprouting tray that takes about 1 kilo of grain, provides around 5 to 10 kgs of green fodder depending on the variety of the grain. With multiple trays being rotated on a daily basis, one can grow a continuous supply of green fodder with very little space and water requirements.

The hydroponics maize fodder looks like a mat of 20-30cm height consisting of germinated seeds embedded in their white roots and green shoots.

### Water requirements for hydroponics fodder production

It has been reported that about 2 liters of water is needed to produce 1 kg of green fodder hydroponically in comparison with about 73, 85, and 160 liters to produce 1 kg of green fodder of barley, alfalfa, and Rhodes grass under field conditions, respectively. This is especially important in areas suffering from chronic water shortages or where the infrastructure for irrigation does not exist. In high cost hydroponics fresh water is used for irrigation

of the hydroponic fodder by using manual or automatic micro-sprinklers or a knapsack sprayer at frequent intervals.

In low cost hydroponic systems, the internal environment of the greenhouse is more influenced by the outside climatic conditions. Therefore, the types of fodder to be grown hydroponically depend upon the season and climatic condition of the locality/region.

Sprouted hydroponics fodder is ready to be harvested within 8 to 10 days. The interlaced roots form a dense mat, which can be cut into serving portions with a sharp knife.

Avoid keeping the fodder more than 10 days in the trays because after 10 days the nutrient value of fodder start to decrease slowly and fiber start to develop.

Wilt the fodder for about 1 hour before feeding it to the cows.

The intake of fresh hydroponic maize fodder by dairy cows may be up to 25 kg/animal/day.

**It is important to note that dairy cows cannot be fed on hydroponic fodder alone because of its low dry matter content. They still**



**require roughage such as hay and other dry forages plus mineral and energy supplements and water.**

For sustainable dairy farming, quality green fodder should be fed regularly to dairy cows. Hydroponic fodder is a good option in front of the farmer because it grows fast, it contains a high nutrient value, and the most important thing is animals like to eat.

Feeding hydroponics fodder to a dairy cow

**Benefits from hydroponics green fodder**

- About 300-400kgs of green fodder can be got from a space of 25 square meters daily. Only 1 person is needed to produce 400kgs of fodder daily.
- Green hydroponic fodder has good palatability. The germinated seeds embedded in the root system are consumed along with the shoots of the plants, so there is no nutrient wasting.
- The farm is guaranteed of a consistent supply of quality fodder throughout the year irrespective of climate conditions. A farmer normally has to wait for at least three months before the fodder can be harvested and fed to the animals. The sprouting system produces feed within 7-10 days.

- Only 1.5-2 litres of water is required to germinate 1kg of maize seed to get 5-10kgs of green fodder.
- Very little less land is required.
- No need of weeding and storage facilities and no post-harvest losses as fodder is produce at the demand rate of livestock.
- Feeding green fodder improves supply of minerals and vitamins to dairy cows hence improves the general health of the animals.
- Hydroponics fodder is an organic feeding strategy---the fodder is free from antibiotics, hormones, pesticides, or herbicides.
- Low costs since there is no need of fuel for harvesting, transportation, and other field operational related costs.

**Hydroponic fodder system as part of disaster relief**

Oftentimes, as a result of drought, farmers lack a way to feed and water their cows. Farmers are forced to sell off their animals very cheaply before weight loss or death — thus losing money. Not only does this situation have direct negative impact on the individual farmer, it also worsens the economic situation for entire communities — making them dependent on the government support and hand-outs from

charitable organizations.

Through design and development of hydroponics fodder technology that produces both potable water and **livestock feed**, it is possible to not only create a short-term relief of an immediate problem, but a sustainable long-term solution to the food crisis that arises after a disaster has passed.

Many farmers are switching from communal to zero-grazing, as pasture land availability becomes scarce, and increased drought conditions make it unproductive.

**Hydroponics maize fodder is nutritious, palatable and digestible and can be grown in low cost devices with locally home grown grains. Against impeding climate change, hydroponics fodder production is an effective alternative technology for sustainable zero grazing dairy cattle production in different regions of Uganda.**

# Maximizing Acaricide Use on Dairy Farms in South Western Uganda: Is It Worth the Cost?



BY DR. HALID KIRUNDA (PHDBVM, MAK)

## Introduction

Livestock extension workers and farmers are constrained with lack of information needed to advise farmers about the choice of method for use in acaricide application in a more cost-effective and efficient control of ticks on dairy farms in South Western Uganda. This study therefore sought to determine the factors of influence in effective, efficient and cost-effective tick control by chemical acaricide application on dairy cattle farms in the sub-region.

## Results

On all the study farms, crossbred cattle were dominant with average herd sizes of 80 head of cattle. Largely (53.3%, 8/15), the farms used paddocks as a method for pasture utilization.

## Factors affecting use of acaricide application methods

### Number of cattle sprayed by a single worker

A total of 51 workers were observed applying chemical acaricide using the bucket pump method, with an equal number observed using a motorised pump. For the bucket pump method, the average number of cattle that were effectively sprayed by each worker was 14. On average, each worker took 1 minute and 4 seconds (64 seconds) to spray each head of cattle. Comparatively, it took each worker 42 seconds to spray each animal by motorised pump and an average of 24 seconds to do so by the spray race method. For ease of understanding, a worker

spent up to 10 minutes 40 seconds to spray 10 head of cattle with a bucket pump, 7 minutes to spray the same number of animals by motorised pump and 4 minutes by the spray race method.

### Cost of acaricide application per head of cattle

The average cost of purchase of a bucket pump was Ushs 700,000 and the pump lifespan was 5 years. Moreover, the other farms spent 2,700,000 to buy a motorised pump of the same lifespan. The average volume of acaricide applied per head of cattle by a bucket pump was 4.27 litres, while that by a motorised pump was 4.00 litres and a slightly higher quantity (4.10 litres) for a spray race. The average cost of

a litre of acaricide during the study was UShs 85,000. For the dilution rate of 1:1, a litre of acaricide would constitute 1000 litres of acaricide mixture. Consequently, the cost of 1

litre of reconstituted acaricide was UShs 85. Based on cost computed per litre, farms using a bucket pump spent UShs 363 per animal each time cattle were sprayed. In comparison, the cost of acaricide per

animal sprayed on the farms was UShs 340 for motorised pumps and UShs 344 for spray races (Table 1).

For the application of acaricide by a bucket pump, labour per worker per month was Ushs 130,000, water used per head of cattle was an average of 4.34 litres and the cost



Table 1: Fixed and operational costs per animal each time of application using the different methods

Application method	Bucket pump (Ushs)	Motorised pump (Ushs)	Spray race (Ushs)
Cost of water for mixing acaricide	60	60	34
Cost of equipment including structures	1146	95	360
Cost of jerrycans	10	10	10
Cost of water reservoir (drum)	4	4	4
Cost of fuel	-	120	50
Cost of acaricide	363	340	344
Cost of labour	18	18	18
<b>Total</b>	<b>1601</b>	<b>647</b>	<b>820</b>

Application Method	1 bovine each time	80 bovines each time	1 bovine per year	80 bovines per year	1 bovine per 20 years	80 bovines per 20 years
Bucket pump	1601	128,080	166,504	13,320,320	3,330,080	266,406,400
Motorised pump	647	51,760	67,288	5,383,040	1,345,760	107,660,800
Spray race	820	65,600	90,688	7,255,040	1,813,760	145,100,800

Table 2: Cost of acaricide application per method

of a jerrycan (bought at Ushs 7,000) was used to fetch water and poured into a drum (water reservoir container) of an average cost of Ushs 150,000. On average, 10 jerrycans (Ushs 70,000) were annually required by a farm of 80-100 head of cattle, while these drums are used for about five years before replacement. Pump nozzles (bought at Ushs 73,000) necessitated replacement twice each year.

**Application of acaricide by a motorised pump involved an average monthly labour cost of Ushs 116,666. The water requirement per head of cattle was 4.10 litres and jerrycan (bought at Ushs 7,000) was used to fetch water and poured in a drum bought at an average cost of Ushs 150,000. A quantity of 2.13 litres of fuel (petrol) was required each time spraying of about 80 animals is undertaken.**

The establishment cost of a spray race, inclusive of the water pump, sump, boma, building, spraying pipes and nozzles, and the drainage crush was averaged at Ushs 43,000,000 with an estimated lifespan of 20 years. The labour per worker per month was Ushs 120,000, while the method used 2.5 litres of fuel (petrol) per acaricide application to 80 head of cattle.

Limitation	Proportion of farms (%)	Proportion of workers (%)
<b>Bucket pump method</b>		
Regular breakdown of the pump	40% (2/5)	
Low pump pressure; application inefficiency	40% (2/5)	
Need for regular crush maintenance	40% (2/5)	
Wastage of time	40% (2/5)	
Wastage of acaricide mixture	20% (1/5)	
Frequent worker exhaustion		80.4% (41/51)
Irritation of skin by acaricide mixture		19.6% (10/51)
<b>Motorised pump method</b>		
Long distance to fuel station	25% (1/5)	
Arm pain during spraying		25.5% (13/51)
Frequent spoiling of plugs		25.5% (13/51)
Fetching of water		25.3% (13/51)
<b>Spray race method</b>		
Very high initial cost of investment	100% (5/5)	
Regular blockage of 'ground' nozzles	20% (1/5)	

Table 3: Critical limitations in use of different acaricide application methods

Computations for the costs involved in use of each of the 3 studied methods of acaricide application per animal during each time of application are shown in Table 1.

#### Herd size most cost-effectively suitable per application method

Since the average lifespan of a spray race used in Uganda is estimated at 20 years, the costs of the three methods were computed for each animal for a single year and for the 20 years. In Table 2, the costs of use of each of the methods per head of cattle (and for the entire herd of 80) per year and for 20 years are presented.

Based on the calculations (Table 2), the motorised pump is observed to be the most cost-effective method of acaricide application while the bucket pump was the most expensive for a single application, in a year and for the 20 year period equated to the lifespan of the spray race.

Since it is discouraged to interrupt the daily routine activities (such as grazing and milking) of cattle, a maximum of 2 hours of interruption on day of acaricide application would be appropriate. Based on this estimation, computation of herd size requirements for cost-effective use of each of the methods of application show that;



**A farm using a bucket pump needed to have at least 40 head of cattle and a maximum herd size of 112 for cost-effective use of the method. With this method only 112 head of cattle can be sprayed within 2 hours on a spraying day.**

A farm using a motorised pump needed have at least 35 head of cattle and a maximum herd size of 170. With this method only 171 head of cattle can be sprayed within 2 hours on a spraying day.

A farm using a spray race required to have a minimum of 100 head of cattle and a maximum of 600. With this method only 300 head of cattle can be sprayed within a 2 hour period. Consequently, a herd of 600 head of should be sprayed in two batches of 300 cattle each and each batch of can be sprayed on a different day.

#### **Efficacy of acaricide application methods**

The study observed that the average morbidity (number of animals falling sick) of TBDs per year for farms using the bucket pump was 42.6% and the average annual mortality (number of dead animals) was 30%. The average annual morbidity and mortality for those using a motorised pump was 9.3% and 4.2%, respectively. The spray race had the lowest morbidity (3%) and mortality (1%). Taking an average cost of treatment for a single case as US\$ 150,000 and the cost of an average sized Friesian cross head of cattle as US\$ 2,000,000, treatment costs for farms using a bucket pump summed

up to US\$ 6,390,000. In contrast, each of the farms using a motorised pump spent US\$ 1,395,000 and that using a spray race incurred an annual TBD treatment cost of only US\$ 450,000. Loss incurred due to death of animals were highest (US\$ 60,000,000) for the bucket pump method, followed by a motorised pump (US\$ 8,400,000) and lowest (US\$ 2,000,000) at farms using spray race application method.

#### **Critical limitations in use of the application methods**

The study observed that various limitations were faced by farm owners and workers depending on the method of acaricide application (Table 2). With exception of wastage of acaricide mixture (20%, 1/5), the other limitations were equally reported by 40% (2/5) of the farm owners that used a bucket pump method in acaricide application.

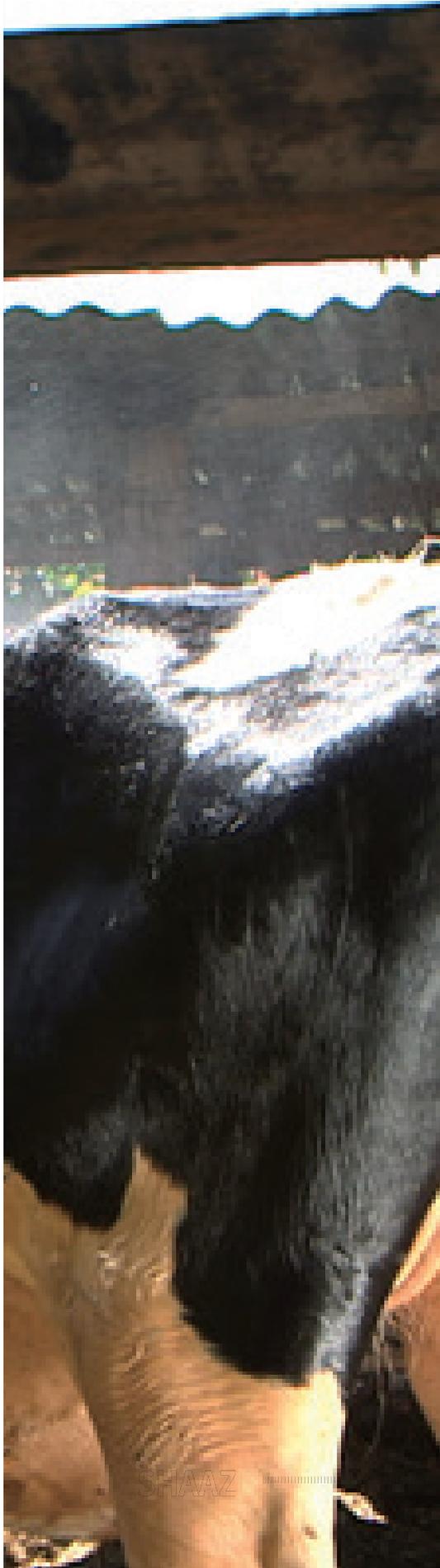
Otherwise, frequent worker exhaustion (80.4%, 41/51) among workers applying acaricide using a bucket pump and the cost of investment in establishment of a spray race by the farm owners (100%, 5/5) were regarded the most critical limitations on the farms.

#### **Conclusions**

The bucket pump method was the most expensive method in tick control. While the cheapest is the motorised pump.

Farms using a bucket pump still experience the largest proportion of death of animals due to tick borne disease and those in use of the spray race have the smallest.

Use of bucket pump is associated with several worker and operation limitations than the motorised pump and spray race. Nonetheless, the spray race has a limitation of the high initial cost of investment.





# Common Issues Affecting Egg Shell Quality

BY DR. JUDE SSERWANO

**Egg shell quality problems range from minor to major deformities and approximately 2% of all layer chicken eggs have some defects, so the chances are pretty good that most, if not all flock owners will at some stage find an irregular egg. This article is about the most common egg irregularities and problems plus their causes.**

## Major causes of egg deformities

### White banded eggs

These eggs are the result of two eggs entering and making contact with each other in the shell gland pouch, causes may be heat stress, change in light program and infectious diseases like IB.

### Blood egg shell

This is so common in young pullets and over fat birds due to rupture of small vessels in the vagina due to excessive straining, cannibalism, vent pecking, sudden change in duration of light or early stimulation before weight attainment.

### Body checked eggs

This occurs in an extra belt like layer of calcium carbonate is

deposited around the middle of the egg shell. Its common with older birds, stressed birds and overcrowded birds.

### Misshaped egg

This may be as a result of stress, defective shell gland, over crowding or diseases like IB/ NCD

### Calcium deposits

This ranges from spots to severe deposits of calcium and mainly due defective shell gland, disturbance during calcification and excessive calcium in the diet

### Irregular pigmentation/ No pigmentation

This may be due to nutrient deficiency like copper, zinc, manganese or magnesium, also it can be due to viral infections like IB, NCD, EDS and AI which affect the oviduct. Internal parasites like nematodes, Drugs like Coccidiostats, Nicarbazin and physical stress can affect the shell color.

### Calcium coated egg

This may be due to excessive calcium in the feed, stress during calcification or defective gland.

### Speckled egg

### Shell-less egg

A shell-less egg can be a sign of nutritional deficiencies, such as

missing calcium, phosphorous, or vitamin E or D. If added nutrients fail to solve the problem, shell-less eggs could indicate infectious bronchitis (IB) or egg drop syndrome (EDS).

### Wrinkled egg

If the egg's albumen, or whites, are underdeveloped and watery, it's difficult for the shell to develop normally, which can result in what appears to be wrinkled shells. It's so common with old birds, diseases like IB, stress in birds and overcrowdings.

### Corrugated shell

This rough, irregularly ribbed appearance can be caused by a variety of external factors. Heat stress, salty or softened water, poor nutrition, or vitamin D deficiency can cause these weird, wavy ridges. While older laying hens are more likely to produce corrugated shells, mycotoxins can also lead to this.

### Soft shell eggs

The causes are similar to those of shell less eggs.

### Translucent shell/mottled

These can be thin and fragile, mainly caused by High humidity, infectious diseases like IB, manganese deficiency, mycotoxins or overcrowding.



Translucent shell



Misshaped egg



Shell-less egg



White banded egg



Calcium deposits



Misshaped egg



Bloody egg shell



Irregular pigmentation



Wrinkled egg



Body checked egg



Calcium coated egg



Corrugated shell



Broken & mended



Speckled egg



Soft shell eggs

Images extracted from Poultry producer.com



Green Power International Limited is a Uganda-based company dedicated to providing high-quality solar energy and water solutions. Locally registered and incorporated since 2017, we are committed to delivering innovative and sustainable energy solutions across Uganda and the East African region.

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### Solar Products

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DAIRY DEVELOPMENT AUTHORITY



MINISTRY OF AGRICULTURE  
ANIMAL INDUSTRY AND FISHERIES



Hon. Frank Tumwebaze  
Minister of Agriculture, Animal Industry  
and Fisheries



Maj. Gen (Rtd) Kyomukama Kasura  
Permanent Secretary - Minister of  
Agriculture, Animal Industry and Fisheries



Hon. Lt. Col(Rtd) Bright Rwamirama  
State Minister for Animal Industry



Rev. Can. Sandra Mugenyi Mwebaze  
Board Chairperson - DDA



Mr Samson Akankiza Mpiira  
Acting Executive Director - DDA

**HEAD OFFICE** - Plot 1 Kafu Road Nakasero, Kampala Uganda  
KAMPALA - National Dairy Laboratory, Dairy House, UMA Show Grounds,  
Lugogo Kampala Tel: +256-414-696-145

**REGIONAL OFFICES -**

GULU - Plot 4, Awach Rd, Gulu Municipality | MBARARA - Plot 3, High Street Mbarara | SOROTI - Plot 5-9 Old Mbale Road, Soroti | BUSIA - Busia Customs Area, MAAIF Building | MALABA - Malaba Customs Area, MAAIF Building | ENTEBBE - Entebbe Dairy Training School, Plot 121 M, Kigungu Road Tel: +256-414-662-217  
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