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# FARMER'S PRIDE

THE MAGAZINE BOOSTING FARMERS

## Nyandarua Transforms Agriculture

### Nyandarua County Improves Dairy Yields

#### Nyandarua County

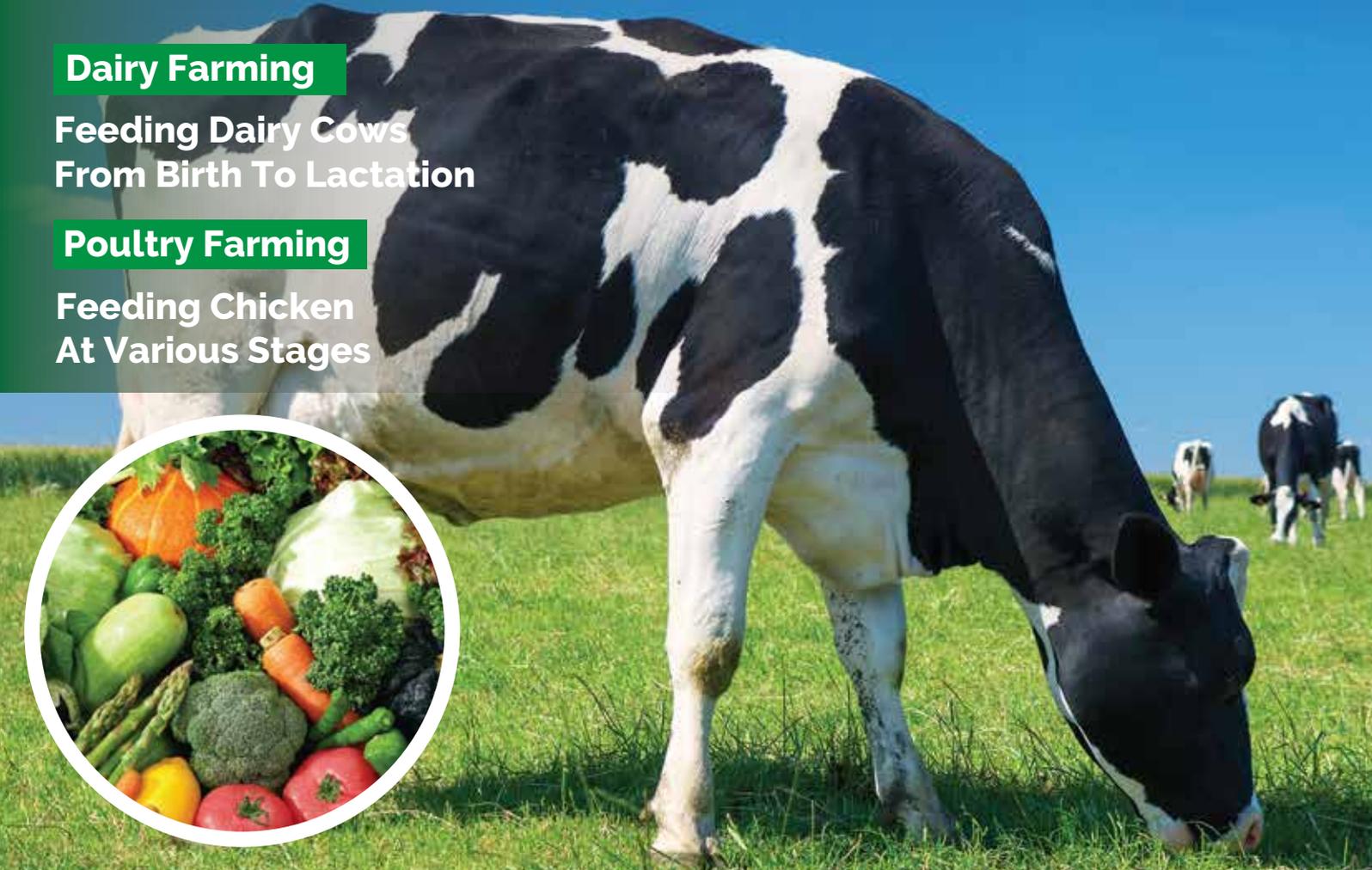
**Badilisha Launches AI to Boost Milk Production**

#### Dairy Farming

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#### Poultry Farming

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# EDITORIAL

## FORMULATE SOUND POLICIES TO INSPIRE AGRI-PRODUCTION

**T**he current administration has been in office for two years, and during this time, Kenyans have become increasingly desperate and disillusioned due to the poor policies being pursued by the government. The administration has been unresponsive to the voices of the people and has continued to impose heavy taxes on the already overtaxed population.

The hardline taxation policies led to the rejection of the 2024/25 Finance Bill by Kenyans. Following demonstrations by the Gen Zs, President William Ruto declined to assent to the Bill in order to calm the volatile situation. Shortly after, he fired the entire cabinet. Kenyans, including farmers, manufacturers, and the entire business community, rejected various clauses affecting their respective sectors.

Even before the rejection of the Finance Bill, grain farmers in the North Rift criticized the government for failing to fulfill pre-election promises to revamp agriculture and make it a profitable investment. They highlighted declining budget allocations for inputs such as seeds, fertilizers, and agrochemicals. The rejected

Bill had slashed the allocation by Kshs. 6.2 billion, which was perceived to have minimal impact on motivating farmers to increase crop production due to the rising cost of inputs.

Earlier in the year, farmers suffered greatly when fake fertilizers were sold to them by the National Cereals and Produce Board (NCPB). The then cabinet secretary, Mithika Lintuli, denied the issue, claiming it was a small portion that entered the market and was subsequently recalled. His impeachment was sabotaged in parliament, and he remained in the cabinet until the entire cabinet was dismissed.

It is important to remind the government that agriculture is the backbone of the Kenyan economy, and no one should be allowed to undermine it. Its contribution to the GDP cannot be overlooked, especially when over two-thirds of the Kenyan population depend on agriculture for their livelihoods, whether through farming or livestock rearing.

Therefore, it is crucial for the government to revisit its agricultural policies to encourage economic growth and improve the lives of Kenyans. Efforts should be made to enhance the production

of export crops and food. The goal should be to return to a time when Kenya was a net exporter of quality coffee, tea, pyrethrum, and horticulture products.

As a first step, the county governments should re-introduce agriculture extension services at the grassroot to guide farmers on proper crop husbandry. These services lack in many counties hence poor yields at harvest.

In addition, agriculture should be given priority in financial allocations at both the county and national levels. Farmers need incentives to produce food for self-sufficiency and export. It is unfortunate that Kenya is a net importer of basic food commodities from neighbouring countries, and this trend should be reversed.

The government should understand that over-taxation will not lead to economic growth. Instead, it will have a negative impact, leading to the closure of industries and discouraging farmers from cultivating their land. Careful consideration should be given before imposing taxes, as the consequences of repeating the bitter lessons learned will be severe.

### Theme of the month

Transformational agricultural production through value addition chains.

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# Nyandarua

## Transforms Agriculture



### Potato Farming in Nyandarua

**T**he Nyandarua County Government is implementing agricultural transformation to achieve food security and create wealth for farmers. This is in line with the change Manifesto of Governor Dr. Moses Kiarie Badilisha which pledged to prioritise agriculture in dairy improvement and revival of agricultural value chains.

The strategies include diversification of crops and Livestock, agro-processing and aggregation as part of interventions being implemented under the five-year development strategy- the County Integrated Development Plan (CIDP3).

The county is renowned for its cultivation of vegetables such as cabbages, carrots and fruits like apples and strawberries. Other fruit crops are currently being introduced. Also, modern farming techniques like greenhouse farming have been embraced boosting the production of high-value crops such as tomatoes and capsicum.

The agricultural cooperatives in Nyandarua are playing a key role in facilitating access to markets, inputs and credit to farmers. Despite the various challenges, the county government supports agriculture through the introduction of irrigation projects, farmer training, and infrastructure development,

ensuring sustainable growth in all sectors and food security for its people.

In the dairy sector, the government is actualising the empowerment programme which seeks to transform the sector by addressing all value chains which have quick gains to farmers. Last year Governor Badilisha launched the County Heifer Project in North Kinagor where 120 dairy cows were distributed to organised groups terming it as "one of the market-driven interventions which we have realized has quick gains and is a low-hanging fruit our people can easily gain from."

This was the second ward, after Shamata, to receive heifers which is expected to be implemented in all the 25 wards in the county. "It is about changing people's lives and putting money into their pockets. This is about sustainable development," said the Governor then.

The dairy program launched in June 2024 by Governor Badilisha at Ol Jororok stadium (see separate story) is founded on three-pronged interventions that address animal feeds, animal health management and feeding and nutrition. The AI program is to be rolled through farmers' cooperative societies and is expected to improve dairy breeds, health and milk yields. At the function, motorcycles and AI kits were distributed

to the 25 wards to be manned by Animal Health Assistants.

For crop production, the governor's agenda is to reduce post-harvest losses, enhance the value of agricultural produce and increase farmers' earnings. The County Government is considering introducing new crops like macadamia and avocado. A year ago the governor had an extensive tour of a macadamia and avocado farm at Kanjuiru ward which demonstrated the potential of the crops growing and doing well in Nyandarua. In addition, the county government recently launched a Ksh. 26 million apple farming venture.

### Potato Production

Nyandarua County is one of the major potato producers in the country. According to the National Potato Council of Kenya (NPCK), potato is the third most important food crop in the world after rice and wheat in terms of human consumption. In Kenya, it is second after maize and contributes about Ksh.50 billion to the economy annually.

The Kenya Kwanza government's Bottom Up Economic Transformation Agenda (BETA) has identified and recognised potatoes as a strategic crop that can immensely contribute to Kenya's economy as well as promote food

security.

Like most other crops grown in Nyandarua, potato farming has its myriads of challenges cutting across seed development to post-harvest losses.

During a recent launch of the Kenya Sustainable Potato Initiative (KSPI) project by NPCK at Ol Kalau, Nyandarua, it emerged that though potato second maize, the productivity per unit area has remained low due to poor agronomic practices coupled with low access and use of poor quality seeds.

Participants from the four potato-producing counties- Nyandarua, Nandi, Laikipia and Meru- highlighted challenges that are commonly facing farmers citing the unavailability of certified seeds as the main challenge. It emerged that only five percent of seed potatoes are planted while 95 percent are produced informally.

They noted that certified potato seeds are rare and few available are not only expensive but inaccessible and only available at ADC Molo farm, Nakuru County. The other challenge the lack of extension services at the grassroots to advise farmers on the best yield practices.

According to the National Potato Strategy (2021-2025) from the Ministry of Agriculture, the potato industry tends to perform below its potential since production is predominantly rainfed and mostly grown in small pieces of land, making it a subsistence crop.

There is also poor adoption of production technologies and poor crop management with inadequate supply and use of quality seed of preferred varieties leading to current poor production of an average of 7-10 tonnes per hectare which, with proper management can be raised to 30-40 tonnes per hectare.

Nyandarua County Chief Officer in charge of agriculture, Samuel Gitaka has said due to various challenges facing potato production, have led to low output resulting in underutilising the 500-tonne cold storage facility at Ol Jororok.

Despite this, NPCK is committed to advancing the interests of the potato industry and supporting the potato farmers, processors, traders and other stakeholders, assured NPCK Chief Executive Officer, Wachira Kaguongo.

He stressed the importance of putting in place necessary institutional policy and legal frameworks on potato production, capacity building for farmers' financial accessibility, fast-tracking of potato value addition and access to the ready market as ways of enhancing potato production.

Through the KSPI project, the focus will be on building a strong and efficient potato seed system that would enhance farmers' access to high-quality seed of



Dairy Cows

appropriate variety, said Mr Kaguongo. AGRA County Director John Macharia says the NPCK is targeting 150,000 farmers from the potato-growing counties and their focus is on all aspects of production, from access to relevant information to seed production, field management, financial and market accessibility.

They are closely working with the International Potato Centre (IPC), NGOs affiliated with potato production and county government as well as the national government. AGRA is also partnering with NPCK to fast-track the full implementation of potato regulation on 50kg packaging which is yet to be fully implemented.

### Poultry Farming

Farmers in Nyandarua North have been urged to venture into poultry farming to combat climate change challenges. The advice came from CARE-USA Vice-president, of the Food and Water Unit, Juan Echanove who visited a demonstration farm in Nyandarua North Sub-county.

The visit was administered to a partnership agreement by the county government and CARE-International in Kenya and the Global Alliance for Improved Nutrition (GAIN) through Catalyzing Strengthened Policy Action for Healthy Diets and Resilience (CASCADE).

Nyandarua County Executive in charge of agriculture Francis Miring'u noted poultry farming has been identified as a rich venture in the dry region because of the warm environment required for keeping birds.

CARE-I Kenya is using a learning demonstration called the Farmers Field and Business School (FBS) model that provides an open space for learning by farmers on new technology that can enhance their productivity.

There is also a programme to introduce drought-resistant pomegranate fruit that requires less water, matures quickly, fetches good prices in the market, and has very high nutritional value. This would combat climate change challenges while at the same time improving nutrition.

Mid this year, Governor Badilisha launched a dairy and pyrethrum value chain improvement programme. For pyrethrum (see separate story), the county government is distributing pyrethrum seedlings to farmers through cooperative societies and organised farmer's groups.



→ Nyandarua County is one of the major potato producers in the country. According to the National Potato Council of Kenya (NPCK), potato is the third most important food crop in the world after rice and wheat in terms of human consumption. In Kenya, it is second after maize and contributes about Ksh.50 billion to the economy annually.



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# Badilisha Launches AI To Boost Milk Production

By Wanjohi Nderitu

**T**he Nyandarua County Government under the leadership of Governor Moses Kiarie Badilisha has launched an ambitious Artificial Insemination (AI) programme aimed at improving daily herd for maximum milk production.

The programme is being implemented through cooperatives to ensure farmers improve their dairy herds to drive maximum benefits from their investment. Nyandarua County is one of the leading milk producers which the Governor aims to increase through the introduction of superior genetics.

During the launch on June 7, Governor Badilisha flagged off cylinders of cryopreserved high-quality semen from superior bulls to improve the breeding program of dairy cows across the county. Motorbikes for inseminators and trained animal health assistants seconded to each partner cooperative were also given out.

AI allows farmers to access superior genetics from high-quality bulls worldwide, leading to improved herd genetics. This results in cows with better milk production, enhanced disease resistance, and other desirable traits, ultimately increasing the overall productivity and profitability of the dairy farm.

The programme, says the Governor, will be backed by technology dubbed

Digicow App and Ndume App. The dairy programme is founded on seeking to address animal breeds, animal health management, and feeding and nutrition, Governor Badilisha explained.

Consequently, super Napier grass cuttings were distributed to the societies and organized farmers groups in all electoral wards in the county, to have the fodder properly propagated for the sustenance of the programme. When well managed through proper planting, fertilization, and harvesting practices, dairy farmers will significantly improve the nutrition and productivity of their dairy cows.

The super Napier is a high-yielding variety, capable of providing more fodder per unit area, which is essential for meeting the feed needs of a large herd. It has good nutritional content, is palatable and well digestible and is also resistant to most common pests and diseases.

Governor Badilisha, who is reputed to have pioneered zero grazing of his dairy herd right in Turkana County when he worked there with the Ministry of Education in his youthful days, says he desires to see Nyandarua milk production increase with improved breeds.

The county government is partnering with the Kenya Animal Genetic Resources Centre (KAGRC) for the provision of semen.

Impressed by his Nyandarua counterpart's programmes, Nyeri Governor Malimu Mutahi Kahiga, who was the chief guest, suggested that calves born as a result of the ambitious AI programme be christened Badilisha I, II, and so on. The event attracted several exhibitors, among them Nyandarua Agricultural Mechanization Services (AMS), Kenya Agricultural and Livestock Research Organization (KALRO), Muki Sacco Society, KAGRC, Kenya Veterinary Vaccines Production Institute and European International Ltd.

Members of the County Executive Committee, Nyandarua County Assembly Speaker Stephen Waiganjo, and a host of MCAs led by area representative Mbogo Mburu, among other leaders, graced the function.



→ The programme is being implemented through cooperatives to ensure farmers improve their dairy herds to drive maximum benefits from their investment.

*The motorbikes for inseminators and animal health technicians.*



# Milk Cooling Plant

## Gives Dairy Farmers Lifeline



*A milk cooling plant*

**A** milk cooling plant built by farmers through a cooperative in Kericho has increased their milk incomes. The plant, Grace Multipurpose Ltd, has over 6,800 registered farmers who are now able to negotiate better prices from milk processors.

The plant is a part of the cooperative's initiative to expand milk collection and cooling facilities at identified centres. The society is providing marketing chilled raw milk to processors and paying farmers promptly, training and extension services on dairy farming, and setting up farmers' service centres where they can get AI services, farm inputs, credit services, feed and fodder, information and skills on dairy farming.

Already farmers in the area have learned about alternative feeds to give their cattle not only increase the quantity of the milk but also the quality in terms of butter content. Farmers can also identify milk from sick cows suffering

from mastitis, an endemic disease in the area that costs them milk production.

Farmers have also increased milk delivery, thanks to intensive training on alternative feeds like growing of fodder shrubs to replace conventional feeds like Dairy Meal which are too expensive for smallholder milk farmers.

"I have three cows which require about 5 kilos of Dairy meal daily each, which means that one bag of dairy meal could go for a week not forgetting the prohibitive cost of about ksh.2500 per bag. But with the new shrubs, I just need to mix them, with only one Kilo of conventional feeds and am covered. It has saved me a lot and has improved the quality of my milk," says Andrew Kiptoo a farmer in the area.

The fodder shrubs are an alternative cost-effective and nutritious way of feeding livestock while increasing soil fertility. The milk processing plant has

changed fortunes for the farmers by ensuring they get returns for their milk delivery. The company gives them access to other dairy-related services like artificial insemination services at subsidized rates. The hall which houses the chilling plant and offices was built partly by farmers in an arrangement where they raised 10 percent of the total cost required, with financial institutions funding the rest in unsecured loans.

Farmers were sold shares in the company with a ksh 100 registration fee and a maximum of 5 shares for sh. 1,000. However, an agreement was reached in 2008 to allow farmers even those who couldn't afford to buy the shares become shareholders through a check-off system by deducting an amount from their milk deliveries. Since its inception, the chilling plant has now grown to over 33,000 litres per day.

"Of course, with these increased production we need to have another chilling plant, which is a

very good sign that farmers have now embraced dairy farming, "said Dan Mithi the Quality Assurance Manager at the company. Farmers are paid better prices by the cooperative which is double the amount, they were being paid by milk vendors.

The fully computerized milk delivery system is transparent where farmers get receipts for milk delivery which is then tallied at the end of the month. The cooperative is training farmers on how to increase the butter content of their milk and benefits of supplying milk using aluminum cans as opposed to plastic cans. Thus farmers no longer deliver milk in plastic cans.

The cooperative organizes exchange visits for their farmers to other areas to benchmark and

learn from the success of those farmers.

The project has not only given impressive monetary returns to farmers but has also allowed them to use the most convenient and cheapest livestock feeding methods while also maximizing on the markets meaning farmers are still left with a lot to save.

Moses Chirchir one of the beneficiaries of the processing plant owns 10 cows which produce an estimated 80 litres of



milk a day. As a shareholder of the cooperative and a beneficiary of the processing plant, he says he can get more income from his cows which has allowed him to diversify his farming activities. "Before we struggled with poor farm gate prices for our milk and also finding the markets to sell all our milk because the majority of farmers keep cows. But with the milk processing plant, we have been able to get double what we used to earn and we are guaranteed of markets and value addition," he enthused.

→ Farmers have also increased milk delivery, thanks to intensive training on alternative feeds like growing of fodder shrubs to replace conventional feeds like Dairy Meal which are too expensive for smallholder milk farmers.



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# Brookside To Support Improved Milk Yields



A cow being milked using a milking machine

**B**rookside Dairy, the leading milk processor in the country recently announced it would start supporting milk supply groups with semen for breeding improvement. This comes at a time when the demand for milk in Kenya has increased tremendously. The demand currently stands at 8 billion litres per year which is expected to grow as the population increases.

The initiative targets dairy farmer groups and selected individual farms and will see it provide targeted beneficiaries with semen straws and liquid nitrogen as the processor moves to increase the uptake of Artificial Insemination (AI) for breed improvement by contracted farmers.

According to the General Manager, Milk Procurement, Mr. Emmanuel Kabaki, the company was partnering with semen suppliers to provide semen straws to their farmers. There would also be sustained training for farmers to adopt and execute the breeding programme.

“Available genetic material of reputable genomic from our local bull stations could be a game changer as we seek to increase milk production in the country,” Mr Kabaki said. Brookside is East Africa’s largest dairy operator and has a daily raw milk-installed intake capacity of 1.5 million litres. The processor is committed to

enhancing farmers’ earnings through milk production.

Dairy farmers in the North Rift; contracted by the company, earned Ksh. 918 million from their milk mainly due to smallholder farmers increased milk production attributed to applied better agronomic practices. The payment is a 27 per cent increase over earnings in 2022. Farmers benefited from increased training programmes undertaken by the company in the region, which led to the adoption of better farm practices.

While attending the University of Eldoret Agribusiness Trade Fair in Eldoret in mid-September, 2024, Mr Kabaki said the company is committed to a long-term partnership with farmers through guaranteed and timely payment of milk delivered to its plant.

“Over the last three decades, we have cultivated an excellent partnership with our 160,000 farmers who supply us with quality raw milk, the critical raw material in the manufacture of quality dairy products,” he said.

The company has an expanded processing capacity and vast sales network which have enabled it to procure all the contracted milk volumes from farmers. “At no time would we ration supply, even in seasons of plenty, as we continue to

procure 100 percent of all contract volumes supplied by our farmers,” he assured farmers.

At the Trade Fair, Brookside sponsored over 600 farmers from the region with Mr Kabaki underscoring the importance of dairy farming to the economies of the rural area. He assured farmers that the company was committed to making milk production a guaranteed source of their income.

The milk processor, he said, appreciated dairy farmers from all over the country for working extremely hard this year which resulted in increased milk production. He urged them to continue improving the dairy herd to produce quality raw milk.



→ Over the last three decades, Brookside have cultivated an excellent partnership with our 160,000 farmers who supply us with quality raw milk, the critical raw material in the manufacture of quality dairy products.

# Nyandarua Revives Pyrethrum



Governors Dr. Moses Kiarie Badilisha of Nyandarua (2nd right), Mutahi Kahiga of Nyeri (3rd right), CEC Agriculture Francis Miring'u (4th right), DG Mwangi Mathaara 5th right and other leaders display pyrethrum seedlings

By Wanjohi Nderitu

**T**he world market demand for environmentally friendly organic pesticides has inspired the Nyandarua County government to step up pyrethrum growing. Before the market was taken over by introduction of cheaper synthetic chemicals, Kenya was leading in pyrethrum production supplying 70 percent of world requirements.

However, the market forces in the 1990s saw pyrethrum production decline significantly with the eventual closure of the Pyrethrum Board of Kenya (PBK) which used to regulate and market the cash crop. The Kenyan farmers suffered double tragedy in lack of international market and destruction by fire of the pyrethrum extraction factory worth millions of shillings in Nakuru in March 2003.

With the new world market, the cash

crop introduced during the colonial era, now not only is the talk in the counties, but it is also rapidly rising to be the flagship project of the government in pyrethrum growing areas.

In Nyandarua County, the good old days when pyrethrum was the only cash crop and major source of income for nearly all farming households and source of employment for many others, were recently reminisced by none other than Governor Moses Kiarie Badilisha, his Deputy Mathara Mwangi and a cross-section of local senior citizens.

The county leadership demonstrated their determination to revive pyrethrum farming when they launched the Badilisha Kilimo (change farming for the better) project on June 7, 2024.

During the colourful ceremony at

Ol Joro Orok stadium, millions of seedlings were distributed to 25 farmers' co-operative societies across sub-counties for distribution to their members, with a projected target of achieving more than 4,000 acres under the crop.

“To ensure sustainability, this programme seeks to work only with cooperative societies and organized farmers' groups. It's about putting money into the pockets of our farmers - it's about transforming lives,” Governor Badilisha says.

The crop used to be so important that it was one of three major cash crops after coffee and tea. It was reflected in Kenya's national coat of arms. The country produced over 18,000 metric tonnes of dried flowers by 1993 grown by over 200,000 farmers, supplying more than 70 percent of the world market - mainly to America.



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However, the introduction of synthetic products, which were cheaper, led to declining demand, adversely affecting the operations of the Pyrethrum Board of Kenya which became insolvent. The board gradually went under with farmers' millions of shillings. Nyandarua alone, according to Governor Badilisha, still demands more than Sh 200 million owed to its farmers. The PBK assets and infrastructure, including the processing factory in Nakuru, laboratories and nurseries closed down.

“A kilo of dried flower is projected to be bought at between Sh 500 to Sh 700, and the pyrethrum content of Nyandarua pyrethrum is much higher than in some other counties,” the Governor says. An acre of the crop can produce an average of 600 Kg of dried flower monthly, fetching an income of Sh 180,000 per month.

The crop normally produces flowers every fortnight for ten months in a year, thus assuring a sustainable cash flow for the growers. It is known for its low toxicity to humans and other mammals, making it safer to use in various settings, including homes and food production areas without posing health risks.

An American firm, Kentegra

Biotechnology, has reportedly entered into a business memorandum of understanding (MoU) with the state-owned Pyrethrum Processing Company of Kenya (PPCK) to purchase the produce which is a ready market.

The PPCK is mandated to produce, process and market pyrethrum and pyrethrum products, conduct scientific and agronomic research, and promote and increase production in the 25 counties.

In Kenya, pyrethrum is grown in 18 counties with Nakuru, Nyandarua and West Pokot emerging as the main producers. The other counties include Uasin Gishu, Kericho, Kisii, Kiambu, Narok, Nyamira, Nyeri, Baringo, Nandi, Meru, Embu, and Muranga among others.

Actually, during the booming days, the crops were often referred to as “White Gold of Kenya.” Nyeri Governor Mwalimu Mutahi Kahiga who was the chief guest at the launch of AI and Pyrethrum said his county would consider promoting pyrethrum growing in Kieni sub-county where it used to do well.

Pyrethrum growing was introduced in Kenya in 1928 and up to 1998, Kenya used to produce up to 18,000

metric tonnes annually on 100,000 acres. It is estimated that Kenya can produce over 20,000 metric tonnes per annum generating between USD 20-75 million for farmers.

The global demand for pyrethrum is growing as it is an incredibly effective, broad-based, natural pesticide with multiple applications in pest control on crops and control of all types of flying insects. This is the advantage Governor Badilisha wants to grasp by increasing pyrethrum acreage in the country.



➔ Before the market was taken over by the introduction of cheaper synthetic chemicals, Kenya was leading in pyrethrum production supplying 70 percent of world requirements.

*A truckful of pyrethrum seedlings that was dispatched to farmers co-operatives*



# Taming The Pest Menace In Kenya's Bread Basket

**F**armers in the North Rift have been experiencing worms and pests attacking their farms and destroying food crops. The pests are said to be largely caused by changing weather patterns making farmers to make huge losses on their produce.

With the assistance of the government, agricultural experts and researchers are seeking solutions to the menace. Some of the identified worms and pests are as follows: Tuta Absoluta, is a worm ravaging tomatoes whose origin is Europe and South America, wipes up to 100 percent yields in days and has continued to wreak havoc on a crop that earns the country over Sh14 billion annually.

Reports indicate that it was first reported in Isiolo but now has spread to most parts of Kenya.

Large areas of mined leaves make farmers mistake it for late blight. The larvae can mine new fruits leaving holes and frass on the surface. Other disease-causing organisms enter the holes and make the fruits rot.

Tuta absoluta reproduces rapidly, with a life cycle ranging from 24-38 days, depending on temperature. The minimum temperature for activity is 9°C. Its larval stage (caterpillars) does not enter diapause as long as food is available. One female may deposit up to 250-260 eggs during her life which are deposited on above-ground plant parts.

Eggs develop into caterpillars, mining inside the leaf, stem or

fruit but exit to pupate. The larva feeds voraciously upon tomato plants, producing large galleries in leaves, burrowing in stalks, and consuming apical buds and green and ripe fruits. It is capable of causing a yield loss of 100 percent.

The pest adult is a moth, meaning

Males are somewhat darker than females. Newly hatched caterpillars are small (0.5 mm) in size and yellowish. When maturing, caterpillars turn yellow-green and a black band develops behind the head. Fully-grown caterpillars measure approximately 9 mm with a pinkish colour on their back.



*A tomato attacked by Tuta Absoluta*

that it is active at night. It will thus lay eggs mainly at night. The moth is almost the same size and posture as the diamondback moth when looked at a distance. The larva (caterpillar) is the damaging stage. Adult moths are grey-brown and have a wing span of 10 mm.

Pupae are light brown and approximately 6 mm.

The pest also thrives on other host plants apart from tomatoes which include nightshade, eggplant, potato, and Datura among others.

Victor Salesa, a horticultural farmer with a bias to tomatoes has

been such a farmer. He has been in tomato farming for a long and have experienced many tomato diseases and pests, but Tuta Absoluta is the most devastating he has ever come across.

He lost yields worth Ksh1 million within a week to the disease which spread unabated. "I started spotting dark spots in tomatoes which were ready for harvest. Before I could diagnose what the problem, was hundreds of my tomatoes had started showing the symptoms," he said.

been beneficial to farms with changes in weather, poor farm management and uncertified seeds fanning this new phenomenon.

By being root crops, potatoes are prone to attack by millipedes which thrive deep inside the soils. The root crops are easy prey especially when the seeds are not from a certified source or are from previous harvests. Millipedes lay their eggs on the potato or any other root crop increasing their reproduction.

At the same time, as rains fail

predominantly attacks maize. It is known to wipe up to 40 per cent of all yields.

Young caterpillars feed on the tender leaves of the plants. They later feed at the growing point into the stem. Seriously attacked plants dry up entirely or partly showing the so-called dead heart. Early attacked plants are stunted in growth and the ears are poorly developed.

However, the concerted efforts of scientists and researchers have developed a new biological control method which is 80 percent effective in containing pests and is friendly to the environment.

The push-pull technology, developed by research scientists from the International Centre for Insect Physiology and Ecology (ICIPE), involves a combination of forage plants which, when inter-cropped with cereals, act as both a trap and a repellent for stem borers and Striga. The two plants being used are Napier grass, which attracts the moths, and desmodium, which produces chemicals that repel stem borers.



It took the intervention of agricultural officers for Salesa to know the pest responsible for his yield loss.

Potato farmers in the region have also reported systemic attacks on their tubers by millipedes, a worm that has traditionally

and farms become dry, millipedes which are known to survive in moist and wet conditions are migrating in search of water. Such movements land them into crops.

Smallholder farmers in the region are also grappling with another worm, the stem borer which



→ The pest also thrives on other host plants apart from tomatoes which include nightshade, eggplant, potato, and Datura among others.

# KEPHIS Hosts International Seed Quality Meeting

The Kenya Plant Health Inspectorate Service (KEPHIS), recently hosted an international conference on seed quality which provided an opportunity for seed actors to share experiences, achievements, challenges, opportunities and solutions.

The conference held in Nairobi from August 19-22, 2024 was attended by over 200 delegates who presented over 81 scientific papers. The conference also deliberated and sought solutions to existing challenges as a result of international safe trade in certified seed.

The theme of the conference was: "Seed quality assurance and technological advances for climate adoption towards sustainable food and nutritional security".

As a government body, KEPHIS is mandated to ensure the quality of agricultural inputs and produce is safeguarded to prevent adverse impacts on the economy, the environment and human health.

According to KEPHIS Managing Director, Prof Theophilus M. Mutui, seed has always been a key focus in agricultural production being the basic and most vital viability and good physiological conditions by the prescribed seed certification standards.

"Seed certification is therefore a critical step in seed production, processing and marketing. This is done to maintain high-quality seed standards while making them affordable and available to farmers with high crop yields," he said.

KEPHIS was established by an Act of Parliament in 2012 with the mandate to regulate all matters relating to plant variety protection, administer and enforce sanitary and phytosanitary measures, and undertake inspection and grading of plants and plant produce among others.

KEPHIS thus recognizes the important role that plant health, seed certification, plant variety protection and food safety play in the country. "Enhanced productivity for a food secure nation and improved market access to our high quality plants and plant products are at the core of KEPHIS existence," Prof. Mutui said.

The state-of-the-art internationally accredited seed, plant health and analytical laboratories continue to support farmers in Kenya to monitor the quality of agricultural inputs and diagnosis of plant pests and diseases, he said.

He added: "Our International Seed Testing Association (ISTA) accredited laboratory in Nakuru provides reliable results to facilitate access to high-quality certified seed via international seed trade."

Kenya's seed industry comprises the formal and informal. Seed sectors with the latter accounting for a higher proportion of seeds planted by subsistence farmers. The seed certification system enhances farmers' access to climate-resilient and high-yielding quality seeds and propagating materials for enhanced productivity. With other government agencies, KEPHIS is streamlining seed trading activities and reducing the cost of doing business.

State Department of Agriculture Permanent Secretary, Dr Paul K. Ronoh noted that Kenya has a National Seed Policy that outlines measures to be implemented to make available adequate amounts of high-quality seed and planting materials.

The policy interventions intend to achieve the following:

- Exploit the potential of improved varieties and technologies for
  - increased agricultural production
  - Build capacity and infrastructure development within the seed industry to handle research and development, quality control, technology transfer and other emerging technologies.
  - Establish an effective regulation, coordination and management of all activities within the seed sector.
  - Create an enabling environment for effective participation of both public and private sectors.

The Ministry of Agriculture is implementing the Agricultural Sector Transformation and Growth Strategy (ASTGs) 2019 -2029 which seeks to transform the critical sector by:

Achieving Kenya's potential to attain food and nutritional security.

- Increase farmers and local communities' incomes
- Lower the cost of food
- Increase employment, particularly for women and youth, and
- Seed quality assurance and plant health.

Cabinet Secretary, Ministry of Agriculture and Livestock Development Mr. Andrew Karanja said access to quality seeds and inputs is a critical determinant of agricultural productivity. "Seed certification plays a pivotal role in promoting crop productivity, maintaining genetic integrity and fostering market confidence," he said.

Over the last two decades, Kenya has invested in seed production infrastructure and services. The government is committed to supporting the seed industry in all fronts to yield the desired impact on food security, said the minister.

Some of the core services KEPHIS provides include:

- Automation issuing of phytosanitary certification and ephytos for exports.
- The seed certification and plant variety protection system
- Pest information management system, a web-based database
- system containing information to report and manage pests.

Among other participants at the conference were the Seed Trade Association (STAK) members. The body is the national umbrella of companies registered by KEPHIS to produce, distribute and market quality certified seeds.



**Kenya Plant Health  
Inspectorate Service**



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# Smallholder Farmers

## Revolutionize Horticulture Industry



*A banana plantation*

**K**enya's horticultural industry has received a boost following many small-scale farmers venturing into the industry. The smallholders are now dumping traditional maize and beans for the lucrative fresh produce which is well-paying.

The boom also has been sparked by the demand in both local and international markets due to consumers being more health-conscious about organic produce which is free from chemicals.

While horticulture farming has been dominated by big companies and farms, smallholder farmers have joined in and are making handsome profits. From fresh vegetables, onions, kale, French beans and herbs, there is no limit to what farmers can now grow.

Alex Mureithi, a high school teacher and a fruit farmer in Kiambu County has established an orchard in his six-acre farm that grows mangoes, avocados, apples, oranges, loquat and cherimoya. But it is the passion fruit- over 1,200 vines in number that

earns the farmer bigger income. "Over 20 per cent of my expenditure and household expenses are met by returns from passion fruits. I have already hired four more acres to expand my passion orchard to boost my earnings," said Mureithi.

Three years ago, with just 150 passion plants, Mureithi was able to make ksh 80,000 in sales while selling at ksh30 per kilo of fruits. Costs are minimal as farmers do not add fertilizer preferring to use farmyard manure from goats and chicken in their homesteads. With the lucrative nature of the passion fruit business, a group of seven local farmers have expanded their orchards to meet the rising demand for fruits in neighbouring towns.

In Vihiga County, a group of farmers are adding value to their bananas, giving their produce longer shelf life. Their earnings have more than tripled from the venture creating an enterprise that has economically empowered over 50 farmers.

Hamisi Horticultural Development Group consists of farmers who

predominantly cultivated bananas in one area but who, upon harvesting, had to deal with the perennial problem of market glut and poor prices.

However, through consultation with some buyers, they formed an outfit that would give value to their banana farming. They decided to venture into making products like cakes, doughnuts, chapatis and banana flour. Pooling their resources, they purchased a drying machine which they use to dry bananas.

The group buys at least 20 banana bunches at ksh 450 per bunch from members or from the local Serem market where they operate the processing business. On average the group spends ksh9, 000 to purchase raw bananas per week.

Depending on whether the bananas will be used to make flour or cakes and snacks, they are separated from those to be used to make snacks which are ripened.

A modest solar dryer is used to dry bananas after peeling which are then dried to form crisps and banana flour,

Turn to page 20



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## About us

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SIMLAW SEEDS history runs back to 9th October 1929 when two English Gardeners Simpson and Whitelaw registered the company then under Indian companies' act 1882. In 1968 the company was acquired by Kirchoff East Africa, a South African based company.

Kenya Seed Company acquired Simpson and Whitelaw in 1979. In 2002 it was registered as Simlaw Seeds Company Limited.

The main responsibility of Simlaw Seeds is producing, importing, marketing and distributing superior and reliable vegetables seeds for commercial and domestic use.

The company has a wide range of seeds that have penetrated the market well and include Cabbage varieties, Onions and Tomatoes that are adaptable to various climatic conditions and adequately meet the local demand.

Other food crop seeds specifically selected for High, Medium and Low altitudes; Bush type beans such as GLP 2 (Rosecoco), GLP 92 (Mwitmania), GLP 24 (Canadian Wonder) and Climber Bean varieties such as Kenya Safi and Kenya Tamu.

Simlaw Seeds Company continues to play a major role in the agricultural sector in the East African Region through strategic partnership, extension services and introduction of products into the market that are geared towards increasing food sufficiency and social well being of farmers.

Simlaw Seeds signifies a strong heritage of seed diversity.

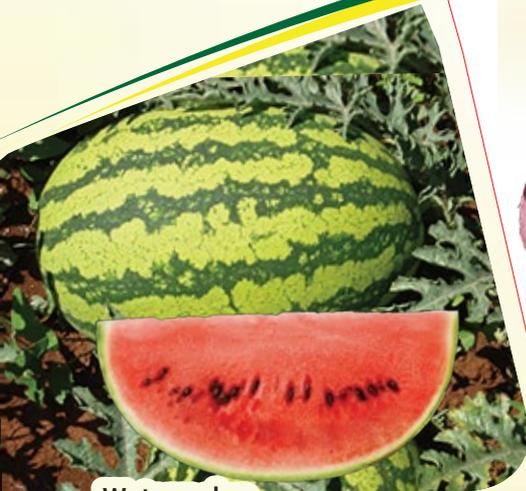
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From page 17

with crisps packaged in 20, 30, 40 and 50-gramme sachets. A 50gm sachet sells at ksh50, with a kilo of flour selling at ksh300.

Under the ripened bananas, the products include cakes and chapatis with the group baking three dozen cakes daily, retailing at ksh200. This translates to ksh20,000.

"It is a very viable business model which we hope to replicate to other produce, especially the perishable produce in our county. It has opened another avenue where members get paid to do what they love. Every member earns a decent income at the end of the month, while we also re-invest some of the profits into the business," said Margaret Amimo, the group's secretary.

For farmers who used to earn ksh350 for a bunch of bananas now earning ksh1200 from the same quantity with value addition. "But we have had to instil a lot of discipline as this kind of business requires such to flourish. We are glad it is paying off," Margaret said.

Other farmers have even gone ahead and started growing specialized fresh produce and can access high-end restaurants in Nairobi.

Juma Mkande who owns a farm in Limuru is one such farmer. His fresh produce is sought after by leading hotels in major towns in

the country." I organically grow the rarest vegetables and herbs including Chives, Italian Spinach, Kohlrabi (a German tulip), and Pakchoi (an Asian cabbage) among others. This is because I was looking for variety to introduce customers to a whole new range of high-value vegetables and shift their minds from the traditional vegetables they are used to seeing," said Juma.

None of his crops are grown with any synthetic fertilizer, but has maintained high growing standards. He applies Maasai goat manure which he gets from Rongai and other Maasai areas. Every month, he buys a truckload of manure at ksh20,000, which fertilizes the entire farm.

Juma supplies over 30 kilos of lettuce to ArtCaffe alone, one of the leading restaurants in the country, plus many other kilos of Italy spinach, parsley and onions. In a month, this earns him between ksh250,000 and ksh300,000. The rising demand for vegetables has also encouraged him to plant more vegetables every week on a rotational basis.

At the heart of this horticultural drive is drip irrigation which has delivered tripled yields for farmers compared to other irrigation methods.

According to a European, irrigation association report on the technology, drip irrigation use increases yields

and economic gains by a greater proportion compared to conventional methods.

The report noted that on the same size of land where a farmer stands to get about 2000 kgs of tomatoes using conventional methods of irrigation, they can get over 7000 kgs using drip kit technology.

The economic use of water by drip kits has been its selling point compared to other methods of irrigation like sprinklers.



→ Kenya's horticultural industry has received a boost following many small-scale farmers venturing into the industry. The smallholders are now dumping traditional maize and beans for the lucrative fresh produce which is well-paying.

### Display of fresh produce of fruits and vegetables



# Biogas-Ōkoa Pesa, Boresha Maisha

African Biogasifier  
Component- Kenya

## Project Brief - 2023

SEE - Clean Cooking



### Project Summary

The African Biogasifier Component Kenya (ABC-K) is a transformative project dedicated to encouraging the use of biogasifier technology in rural and urban communities across Kenya.

Supported by the Dutch Ministry of Foreign Affairs, the European Union, and the Danish International Development Agency (DANIDA), the project is a part of a broader initiative called Strengthening the Energy and/or Ecosystem for Clean Cooking (SEEC-ECO).

The African Biogasifier Component (ABC) in Kenya aims at facilitating a shift of the biogasifier market from its dominance to the expansion phase where more than 20,000 small (10 to 50 m<sup>3</sup>) and 200 medium (100 to 300 m<sup>3</sup>) digesters are installed.

### The Challenge

Commercially, particularly in rural regions, face several difficulties, including limited financial, technical, energy costs, and health costs, unrelated to conventional cooking methods. Moreover, information and a lack of awareness regarding biogasifier technology and its benefits to its users. ABC-K is engaged to confront these issues, providing education, training, and support to reduce energy-related energy accessibility.

Cooperating with



Cooperating with



Cooperating with



### The Project

ABC-K seeks to facilitate access to biogas cooking for over 100,000 people and modern energy for 200 small, medium and large businesses by 2025. By installing 20,000 small and 200 medium digesters, it aims to stimulate a sustainable, reliable energy and sustainable farming.

The project will raise awareness about the benefits of biogasifier, demonstrate the surrounding the technology, offer training opportunities, and provide support services. It will address the critical challenges like clean cooking, health benefits, and time saving while tackling challenges such as financial constraints, fuel and norms, and hygiene concerns. The end users are a diverse group comprising both farm and urban farmers, Biogasifier Construction Entrepreneurs (BICE), and urban professionals (mainly aiding their rural relatives).

### Project Partners

ABC-K works in collaboration with various partners including the Ministry of Energy and Petroleum, Ministry of Agriculture, Livestock, Fisheries and Cooperatives, Council of Governors, biogasifier entrepreneurs, village organizations, and private financial institutions. The project implementation is carried out by GIZ, DANIDA, and ABC-K. We are thankful for the support from all our partners, including the use of an array of sustainable and green living.

# Feeding Dairy Cows From Birth To Lactation

**A** dairy cow is a significant investment for your farm. Indeed, a cow that produces significant quantities and qualities of milk will not only avail food for your family, it can also be an extra source of income for yourself and your family.

Moreover, dairy cow farming also contributes significantly to employment, within and outside the firm. For instance, farming supports a large service sector which offers specialized and key services in the nutrition as well as the health sectors. In addition, manure from dairy cows can also contribute significantly to improving soil fertility, more so in this era where there is rampant

varieties and types differ depending on the age of the cow. For instance, for a calf, the first 24 hours are essential for development and creating the immunity of your newborn calf.

In the first hour of Calving, the initial colostrum is most especially important for your calf, as it determines your calf's resistance and immunity from diseases. The first colostrum milk is packed with essential nutrients and minerals which build a strong immunity system for your calf, protecting it from any potential diseases during this sensitive phase of their lives. At this stage, the colostrum becomes a very important meal that your cow

calf at least four litres of milk and the quality of your colostrum must be assessed if it contains enough antibodies as well as purity (you can do this using the colostrum meter and optical measures).

In the proceeding 24 hours of life, you can continue feeding them colostrum, albeit 2 liters of colostrum milk. Indeed, after having a good feed, your calf can rest for a while, at least 12 hours before feeding the next meal to your calf. Indeed, about 6 litres of milk a day is enough for your cow.

During the preceding phases of your calf's life, before growing into a full cow, the transition milk, and



*Feeding milk to a calf*

deforestation and deteriorating soil fertility.

Indeed, having proper feeding and management practices for your cows right from birth till lactation will contribute significantly to the health and well-being of your cow, as well as maximum output in form of higher yields of milk.

## Calf Rearing

It is important to know that feed

can ever have.

Moreover, the absorption capacity for antibodies, minerals and essential nutrients during this hour is the highest, and it gradually continues to decrease with every passing moment.

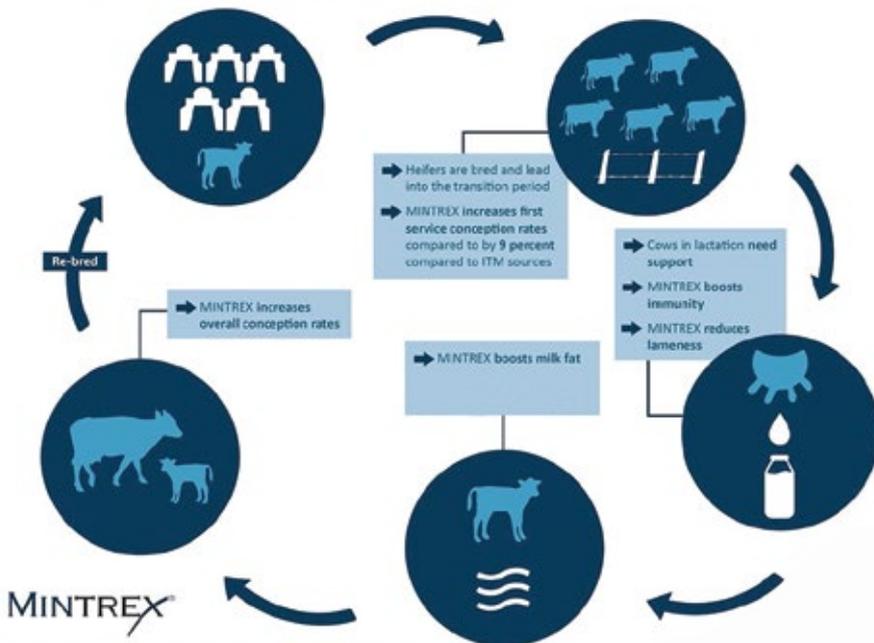
Indeed, during this time, the most important consideration during feeding is considering the quality, temperature of colostrum, speed as well as volume. As some experts recommend, you should feed your

subsequent normal milk offers a good feed for your cow. Transition milk, which is essentially the milk following the colostrum, should be fed to your calf. It is important to note that normal milk administered to a calf should have a temperature of at least 40 degrees Celsius. As some experts dairy cow is a significant investment for your farm. Indeed, a cow that produces significant quantities and qualities of milk will not only avail food for your family, it can also be an extra source of income for yourself

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During the preceding phases of your calf's life, before growing into a full cow, the transition milk, and subsequent normal milk offers a good feed for your cow. Transition milk, which is essentially the milk following the colostrum, should be fed to your calf. It is important to note that normal milk administered to a calf should have a temperature of at least 40 degrees Celsius. As some experts recommend, it is important for the calf to drink the milk much quickly, as this may have a desirable impact on the quality of the milk being produced.

### Feeding your growing Heifer

This phase of a cow's life is essentially a period of continual growth, and may last considerably up to the 15th month of the calf's life. During this time, the most important aspect is maintaining its body weight, a good frame for the cow, as well as for production purposes. For a growing cow, standard weight should be between 500 and 800g per day, for achievement of its weaning targets.

For this stage, you may consider switching to young stock supplements, most of which are available monthly. For instance, some heifers may require 1 to 2 kg of feed dependent on the state of the animal, as well as the quantity of pasture or fodder. Moreover, you should also incorporate additional supplements, such as stock lick, in addition to water, to be provided every day to the animal all day.

However, if you have good quality pasture, your heifers can still do well without the supplements. As you do this, your heifer will continue to grow. Please note that you should not over-feed your heifers, as this can reduce the conception rates of the heifer. The pasture to feed your cattle should be legumes, such as Desmodium, shrubs and young herbs.

Feeding a heifer is also a sensitive period of the calf's life, especially before calving. As a farmer, you should work to provide nutrients that meet the high demands of pregnancy. A common practice, often known as 'steaming up' is essentially the practice of feeding your cow

significant amounts of dairy meal before calving. The purpose of this is essentially preparing your cow for pregnancy, and is often done during the last six to eight weeks before calving.

Moreover, feeding your animal well during this period in time also ensures the calf to be born is healthier and more resistant to diseases, ensuring it grows and develops much faster. Moreover, the young heifer at this period would also need a lot of nutrients to meet the growing demand of accommodating a new being.

### Feeding a Lactating Cow

Generally, lactating cows ought to be fed fodder and forage of good quality, as well as a dairy meal in proportion to the amount of milk produced. During this phase, the key target of feeding the cow should be to maximize milk output (in quantity and quality of production.) This is why dairy meal is an important aspect of feeding at this stage.

During this period, if the quality of your forage is poor, you will need to administer more dairy meals to your cow, however noting and observing the limits of daily intake, as not observing will increase your milk production costs, in so doing reducing your profits.

If you observe all the requirements and properly feed your dairy cow, right from the calf stage to the heifer and subsequently cow stage, not only will you have a healthy and well-maintained cow, but you will also have higher outputs and milk production, which will be profitable for your farm business.



→ In the first hour of Calving, the initial colostrum is most especially important for your calf, as it determines your calf's resistance and immunity from diseases.

# Techwin Limited:

## Your Partner In Dairy Processing Solutions

Techwin Limited is a manufacturer and supplier of comprehensive dairy processing equipment in Kenya from small-scale farms to large processors. Located in the Nairobi Industrial Area, along Enterprise Road, Techwin offers an extensive range of solutions tailored to meet the unique needs of each client.

Our product lineup includes everything from milking machines and transportation tanks to milk cooling solutions such as milk coolers and cold rooms. We also specialize in pasteurization, UHT processing, and packaging, alongside value-addition equipment like yogurt making

machines, cheese, and butter.

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Techwin Limited, Homa Bay Road, off Enterprise Road, Industrial Area, Nairobi.

**T**he renowned Kenchic is celebrating its 40th anniversary as Kenya's leading producer of high-quality poultry products. Over the years it has consistently set up standards for excellence in the poultry industry particularly in biosafety, modern poultry farming and product innovation.

Kenchic has gone a long way to ensure sustainability, quality and local partnership which have proudly shaped the poultry industry in the country. It evolved from a small enterprise to the current leading brand name in poultry production in Kenya.

"We haven't done this alone. Our success is built on the dedication of our staff, farmers, and our partners and on the trust of millions of Kenyan families who choose Kenchic products for their tables," says Managing Director Jim Tozer.

He says that the firm's purpose has always been about more than just producing quality products, but also creating shared prosperity by ensuring that everyone, from a peasant farmer to the largest retailer benefits from Kenchic's success.

It sources its inputs locally including feed, and those inputs support numerous sector players like agricultural firms and service providers including transporters and veterinarians. The company employs over 1000 staff across various roles contributing significantly to job creation and economic growth.

Indeed, poultry farming in the country is a big contributor to the economy in terms of both output and employment.

# KENCHIC MARKS 40 YEARS OF EXCELLENCE

While appreciating the firm's commitment to the communities it operates from, the MD says they are accountable for fulfilling their promises to over 30,000 small to large-scale commercial farmers they directly work with as well as the entire poultry ecosystem.

Established in 1984, Kenchic dominates the processed chicken market with unmatched product quality food safety and traceability. Its range of products includes processed chicken meat such as whole chicken and cuts, sausage, burgers and the company's newest breaded chicken range, Crispy Kuku.

In addition, due to growing demand for high-quality beef, the company launched Kenbeef which offers premium cuts like ribeye and sirloin. This is due to the company's commitment to diversify its product offerings while maintaining high standards of quality.

Kenchic's premium day-old chicks play a pivotal role in enhancing the livelihoods of poultry farmers in the region. The three lives of day-old chicks are: Broiler, Layer and Kenbro. Kenbro is an improved Kienyeji dual-purpose bird that can give eggs or meat depending on the needs of the farmer.

Food safety is a worldwide concern especially the Antimicrobial Resistance (AMR) which is now a global priority.

At Kenchic, food safety has been a core focus of its operations. The company is dedicated to protecting its customers from the risks of food-borne illnesses particularly those caused by harmful pathogens.

Mr Tozer points out that AMR poses a serious threat to modern medicine and food safety which he said, was not only an issue for government bodies or international organisations but requires collective action from producers, resellers, consumers and policymakers.

The company also prioritizes human and ethical farming practices to produce high-quality, nutritious products. It maintains global standards in caring for its animals and focuses on minimizing stress throughout the production process.

In 2011, Kenchic was the first company in Kenya to attain Food Safety System Certification 22000 (FSSC 22000). It was recently re-certified as the most comprehensive Food Safety System standard which is recognized by the Global Food Safety initiative.

On its part, Kenchic has an in-house ISO-certified laboratory that tests every batch of chicks and chicken products against pathogenic bacteria and antibiotic residue.

Other innovative processes include:

- Providing environmental enrichment such as perches and nest boxes for breeder chicken in all its in-house and contracted broiler farms.
- Innovax (vaccine technology) provides comprehensive, life-long protection against Infectious Bursal Disease (IBD) or Gumboro, New Castle Disease (ND) and Marek's Disease (MD) in a single, three-in-one dose at the hatchery.
- ISO accreditation of Kenchic's processing plant, hatchery and the laboratory.
- Introduction of infra-red debeaking reducing the pain to the birds caused by crude on-farm procedures.
- The processing plant is one of the most modern in Africa producing its products in line with international standards.
- Modernising chicken houses by making operations efficient and environmentally friendly for its flocks.

*Indigenous poultry*

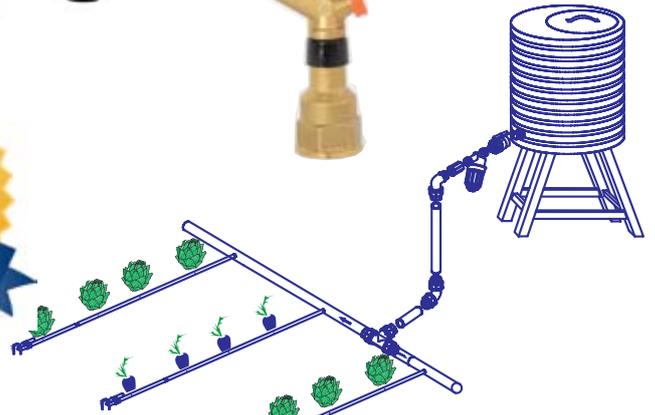


→ Established in 1984, Kenchic dominates the processed chicken market with unmatched product quality food safety and traceability.



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# Water Harvesting For Small Communities In Kenya

*Rainfall has proven to be an unstable and non-reliable source of freshwater due to the changing climatic and weather patterns. Even dry spells amid rainy seasons can also cause dire consequences as entire drought seasons*

**F**reshwater is becoming an increasingly scarce commodity in many regions, and the East African region is no exception. Indeed, water resource availability and management are issues of growing importance for many Kenyans. Despite concerted efforts by the government, citizens, and national bodies, access to freshwater remains a significant concern.

Moreover, rapid population growth, coupled with increasing urbanization, has continued to stress the available water resources in the country. There is a growing concern over the future supply of water, which has sparked much debate. Rainfall has proven to be an unstable and unreliable source of freshwater due to changing climatic and weather patterns. Even dry spells amid rainy seasons can have dire consequences, akin to entire drought seasons. As a result, there is an increasing outcry for alternative sources of freshwater, especially in rural areas

where there is an overdependence on agriculture.

In arid areas, even a small reduction in precipitation can lead to severe consequences. Water is needed more than ever to prevent crop failure and satisfy water needs during drier seasons. For instance, in 2011, drought and famine affected the northern Kenya region, drawing considerable international attention and concern. All these vulnerabilities have a profound impact on the food and economic security of many Kenyans.

Kenya, already classified as a water-scarce country according to some reports by USAID, has minimal freshwater supplies. Estimates indicate that the country has just over 600 cubic meters of water per person, with projections suggesting a decrease due to increasing droughts and population growth. More than half of Kenya is considered arid or semi-arid, with large portions

deemed unsuitable for agricultural purposes, leaving many farmers reliant on rainwater.

Compounding this issue is continued deforestation and encroachment on water catchment areas, which limits water flow into rivers. Given these factors, it is prudent to explore alternative methods of accessing, collecting, or storing water. One viable option is rainwater harvesting.

Rainwater harvesting involves the collection, conveyance, and storage of rainwater for various uses, such as domestic purposes, biomass production, or for crops, trees, and pasture. As a practice that dates back thousands of years, rainwater harvesting remains a reliable and sustainable source of water. Unfortunately, water storage remains critically low in many regions of the country and has decreased significantly over the years.

*Harvesting rain Water*



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*A cement water tank*

### **Rainwater Harvesting Techniques in Kenya**

Both traditional and modern techniques for harvesting rainwater are in use in Kenya. Traditional methods date back thousands of years and include techniques such as earth bunds and Zai pits. Earth bunds have been an important technique for many agricultural communities in the Horn of Africa, while Zai pits have been prevalent in western Africa. These traditional practices are especially pronounced in drier areas, where rainfall conservation is crucial for the survival of many communities.

On the other hand, modern techniques for preserving and harvesting rainwater are becoming increasingly common in many regions of Kenya. These include rooftop water harvesting, the use of dams, pots and pans, retention ditches, contour earth ridges, and vegetative strips. For instance, the use of rainwater harvesting tanks has gained popularity among Kenyans, and it is common to find many cement or plastic tanks in households.

Cement tanks can be constructed above or below ground and are considered a secure, reliable,

and convenient source of water. This water is primarily used for domestic purposes such as washing, drinking, and cooking. In extreme drought conditions, some families may reserve rainwater exclusively for drinking, using other water sources for other activities.

### **Sustainability of Water Harvesting Techniques in Kenya**

While a large plastic or cement tank can store a significant amount of rainwater, it raises important sustainability concerns. How long is the stored water likely to last? During prolonged drought, for instance, a 10,000-liter tank may sustain a family of ten for a month at most.

Sustainability is a critical consideration when discussing water harvesting. A sustainable water harvesting source is one that can be successfully maintained

without compromising the needs of future generations. Rainwater harvesting techniques face significant challenges, with sustainability being a key concern. Many cement tanks have deteriorated over time, cracking or collapsing entirely, becoming dysfunctional. Many projects have also been short-lived.

Moreover, corruption has led to the construction of substandard water harvesting systems that do not endure. In some cases, proposed water harvesting sites have not been constructed at all, such as the recent Aror and Kimwarer dams, which were embroiled in a corruption scandal. Extensive research is needed to determine the viability of these techniques and to create a standardized certification process that ensures the quality of construction, maintenance, and operation of water harvesting systems.



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# Feeding Chicken At Various Stages Of Growth

*“You should avoid fatty foods for your chicken, such as sunower seeds which can destroy your chicken’s internal systems and kill them without warning.”*

**B**reeding chickens, right from when they hatch to full maturity, is not an easy feat, especially if you are handling many chickens. Indeed, different phases of growth require different feeds. As you identify the best feeds for your chickens, you need to determine whether your chickens are layers or broilers, as this significantly affects the type of feeds to be used.

Moreover, feeds for indigenous chickens differ from those of farm-bred chickens. In fact, indigenous chickens may survive without store-bought food, as they forage for any available meals. As you deliberate on the type of feeds to choose, here are some do’s and don’ts that you should consider:

## First Few Weeks after Hatching

A newly hatched chick is almost completely helpless. Just like any other creature, the chick should have access to safe water and be fed well. It is important to ensure they have access to clean and fresh drinking water at all times. Having water before eating is crucial during this stage, as it helps prevent food from sticking in their bellies.

If possible, use warm water during this stage, always ensuring the drinker is easy to clean for sanitation purposes. After this, proceed to feed your chicks some starter meals, most of which are readily available at any animal feed shop. Please remember not to feed

your chicks layer meals or any other meals apart from starter feeds. Layer meals, such as layer mash, may contain a high calcium content that could damage the chick’s internal systems. Don’t let the feeder materials accumulate; allow the chicks to empty their feeders before filling them again. Letting dirty or stale feed accumulate is very unhealthy for chicks.

After the eighth week, you should introduce grower feed to your chickens, which contains more protein than starter meals but less calcium. This is because the dietary requirements of a chick between 6 to 20 weeks old differ significantly from those of a newly hatched chick. Grower meals are important during this stage of your chickens’ lives, as they support ongoing growth and development.

During this phase, it is important not to feed them layer mash, as layer meals contain many minerals and vitamins that are unnecessary for the chickens at this stage and may adversely affect their internal organ function.

## 20 Weeks Onwards

When your layers start laying eggs, it’s a good sign that they are ready for layer mash. Layer meals are generally formulated to meet the bodily requirements of mature hens and contain proteins, calcium, vitamins, and other important minerals. Alternatively, for broiler chickens, feed them

varieties dense in protein, as high protein levels encourage faster growth. As you decide on the types of feeds for your chickens at this stage, you should supplement their feed with additional calcium, such as ground egg shells.

Since hens during this stage may need grit to aid in digestion, you should add this to their meals, especially if they do not forage.

Avoid fatty foods for your chickens, such as sunflower seeds, as these can harm their internal systems and potentially be fatal. Indeed, excessive fat around the liver can make the chickens’ livers too soft and prone to bleeding. Avoid feeding your chickens salt, as salt is not part of their diet.

By following these guidelines, you will keep your chickens healthy, happy, and well-fed.

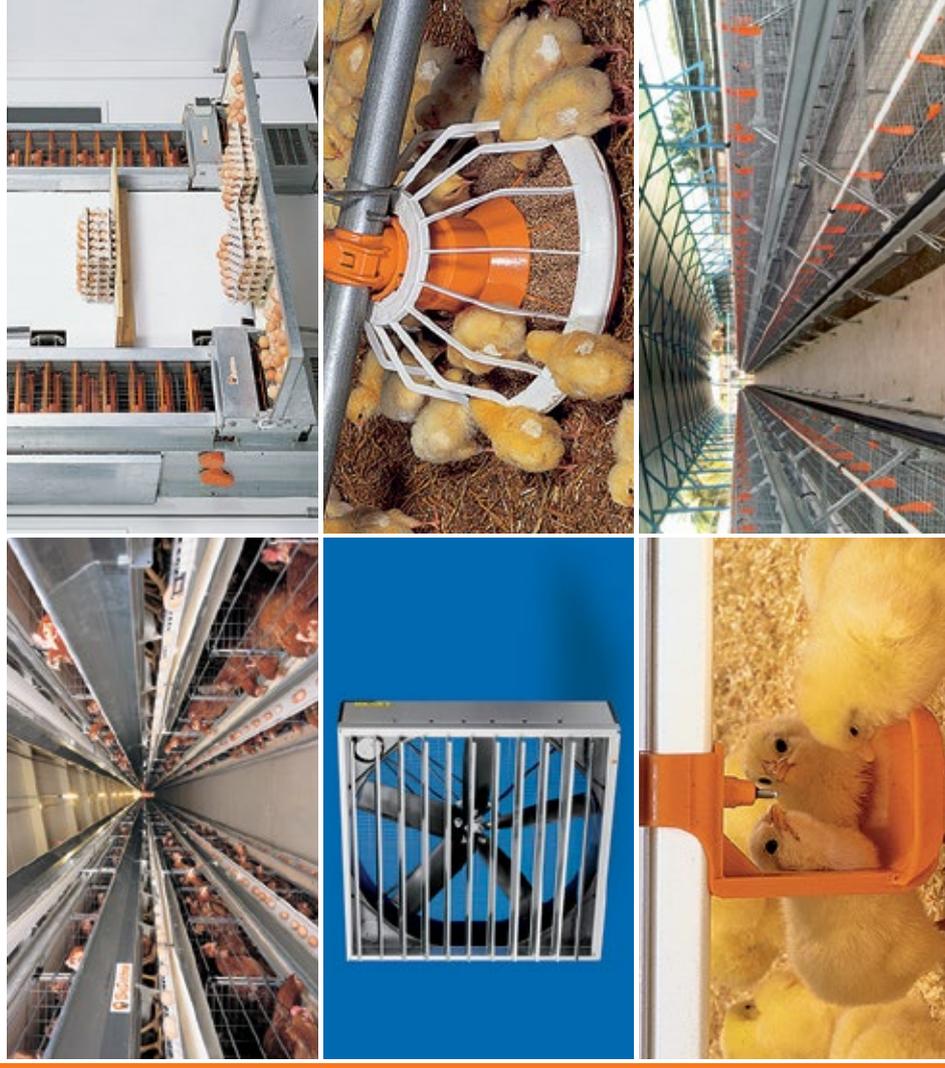


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# Farmers Turn To Profitable Pig Rearing

**T**he growing demand for livestock products in Kenya is inspiring farmers to join the sub-sector which is one of the top income earners in the agriculture sector. The sector contributes a large percentage to the economy, especially to the export market.

The demand in the market for pig products has inspired farmers to rear pigs despite the high cost of manufactured feeds. However, the government and research institutions are helping farmers by researching alternative feeds that are nutritious and affordable.

John Muoko rears 100 pigs in his one acre farm in Ruai, on the outskirts of Nairobi which he sells to butchers and other buyers. Among the pigs that he keeps include sows, piglets and boars.

“What makes this venture more appealing is that I have managed to keep my expenses very low. Pig farmers complain about the exorbitant price of conventional feeds, but I have perfected the art of getting feeds from where it is produced, bringing down the expenses considerably,” Muoko said. He buys feeds like rice bran from Mwea Irrigation Scheme where it is in plenty, at ksh. 450 a 70kg, which costs ksh. 1600 in Nairobi.

The bran is mixed with other supplements and minerals. He also buys waste cabbages from Wakulima Market at ksh. 150 per bag. “I feed them once a day and ensure they are well fed and there is constant check from a veterinary officer. With that I have managed to keep them healthy and attractive to buyers,” he added.

At seven months he sells them at between ksh. 15,000 and ksh. 25,000. He started pig rearing by buying the first three sows at ksh.100, 000. From the initial investment, the sows gave piglets each and that is how the brood has grown. Because of limited space, he has built storeyed pens for the pigs.

He has also invested in four daily cows and 30 indigenous chickens. Although he says the cows and the chicken are not for commercial purposes, he is looking forward to expanding the venture in future.

“At 35, I would not wish for anything else. I have enjoyed this kind of farming, especially doing it in the urban areas where most people believe it is impossible. I have employed two people who have been of great help to me, and most importantly, I have built a business I never thought would give me such returns within such a short time. There is money in farming,” he said.

In the Maragua area of Murang'a County, Daniel Kibe, a retired teacher has also perfected pig rearing at a time when many farmers have given up partly due to exorbitant feed costs.

His venture into farming was inspired by a visit to the internet, some five years ago which emerged not just as a model farmer, but a trainer in fodder production.

“I wondered how farmers in arid and semi-arid parts of the world like Australia were feeding their animals. Out of curiosity, I searched fodder in Australia and that is where I scrambled on the hydroponic fodder,” noted Kibe. Little did he know that hydroponic fodder technology would be his breakthrough in life.

“The tutorials I got from the internet were of automatic ways to raise the fodder, but I adapted the same using manual means and was very lucky to come up with a commendable end product. I use barley seeds and a few chemicals which I put under controlled conditions to come up with the end product,” he added.

Kibe took advantage of the technique and used it to diversify his investment in agriculture to include piggery, dairy farming, sheep and local chicken. He noted: “As a farmer, I have learnt that for one to succeed, he should diversify to cushion himself against the unforeseen risks involved in the various farming practices.”

Kibe has diversified and currently boasts of having 5 dairy cows, over 200 sheep, over 70 pigs, 300 indigenous chickens and one acre under strawberry farming.

To support farmers and boost pig rearing, government and research institutions have been working with farmers to find alternative low-cost feeds. For example, researchers at the International Potato Centre (ICP) are training farmers on a sweet potato-based pig feed that provides them with a low-cost alternative to commercial pig feeds.

Based on a Vietnamese program that produced outstanding results years ago, the feed is made by fermenting sweet potato veins and tubers to increase their nutritional value as suitable meal for the hogs. The fermentation turns roots and vines into silage which offers easy feeding for the swine and preservation of up to nine months.

Once farmers harvest the sweet potatoes, the vines are wilted to reduce moisture content. The roots and vines are then chopped, mixed with supplements and stored in airtight plastic bags. According to the researchers, the improved feed will allow farmers to keep high-yielding cross-bred pigs, replacing much smaller and slower-growing scavenging pigs that spread zoonotic diseases such as the highly contagious and fatal cysticercosis. Other elements of the program include better husbandry, animal housing, and the use of feed supplements and drugs, which are said to increase the weight of pigs and greatly raise farm income.

On marketing, the prices are largely determined by estimates of pig traders. However, researchers at The International Livestock Research Institute (ILRI) have taught farmers a simple pig measuring tool that allows pig farmers to sell their pigs through weight measurement.

When the ILRI field officers carried out the study of the pig buying model using visual estimates they discovered that the farmers were losing between 15 kgs and 20 kgs of sales price in the visual estimates. Farmers visually calculated a pig as 40 kgs, which would after measuring weigh 60 kgs.

The method of measuring the pig involves inserting a uniquely numbered ear tag in the pig's ear, then measuring the pig with a tape from the midpoint between the ears to the point where the tail joins the body, to determine the body length. The girth is measured around the pig's body, just behind the forelegs.

Farmers then calculate average weight values for the length and girth of every animal. The farmers then record the weights in monthly cards and charts supplied by ILRI to track the weight performance and growth of the pigs. When selling the pig, the farmer calculates the weight in kilos and bases the price on the retail price of a kilo of pork in the local butcheries.

“Looking at all these developments and the growing appetite for pork, I want to keep rearing pigs. Indeed, the future of pig farming in this country is bright,” said Muoko.



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