

Dairy for Development: 'The Jersey Footprint'



**Royal
Jersey**
AGRICULTURAL
& HORTICULTURAL
Society

Royal Jersey Agricultural & Horticultural Society

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Dairy for Development Overview

The RJAHS has a long history of developing dairy industries around the world, with export of pure-bred Jersey cattle beginning in the 18th century and expanding rapidly in the 19th and 20th centuries. Jersey cattle are now the second most popular breed of dairy cow globally, found in over 100 countries worldwide. The desirable traits offered by the Jersey cow relative to other breeds, which include earlier reproductive age and ease of calving, greater milk quality, and greater milk production relative to size and feed intake, are well known internationally. Jerseys are also more heat tolerant and disease resistant than many other pure dairy breeds. These traits make Jersey cattle, or more often a Jersey crossbreed, ideal for many smallholder farmers in resource-poor contexts. Supporting developing dairy industries by providing Jersey Island genetics, mainly through export of frozen bull semen, remains part of what we do, but in recent years the Society's international work has expanded significantly into a range of 'Dairy for Development' initiatives around the world.



Dairy has the potential to be transformational in economies reliant on small-scale agriculture. As a livelihood source, dairying can generate high margins by area of land, and provide a more stable cash flow in comparison with many food crops. Cattle can be fed on non-competitive (with humans) feed, and dairying is also labour intensive, not least in twice daily milking, so has the potential to create jobs in densely populated rural areas. Demand for milk and 'value added' products such as cheese also tends to grow in proportion to income as countries advance from low to middle income status, and as populations urbanise. Increasing need to transport and process milk can create additional jobs in the local economy. There are also health benefits as well as economic - increasing dairy consumption can improve diets for populations reliant on grain and tuber staples, providing essential nutrients including protein, fat and various micro-nutrients.



The Society now works in a range of countries with partners including charities, private companies, universities and farmer associations, strengthening dairying from farm level to national level, to improve the incomes and food security of vulnerable people. Support ranges from technical advice in cattle fertility, health and genetics, to strengthening livestock information services and extension worker capacity, to providing training and improving access to inputs and finance for farmers at the base of the dairy value chain. We currently lead three focused Dairy for Development projects - in Rwanda, Malawi and Ethiopia - generously funded by Jersey Overseas Aid. We also work with international and national stakeholders to support cutting-edge dairy cattle research and policy dialogue. Read on to find out more about our main projects...

Why dairy?

The majority of the world's poor live in rural areas and are dependent on agriculture to survive. Of the approximately 900 million globally who in extreme poverty (earning <\$1 per day), approximately 500 million of these people rely on livestock as their primary livelihoods source. Globally, it is estimated that almost 150 million farm households, i.e., more than 750 million people, are engaged in milk production, the majority of these in developing countries. The potential impact of improving dairy production is therefore significant. Benefits include improved health outcomes (through strengthened nutrition), economic growth (through increased incomes and market development) and environmental benefits (through improved productive efficiency and promotion of sustainable practices).

In much of the world, especially the poorest populations, people consume no or very small amounts of livestock-derived foods and have little choice over what to feed themselves and their families. Malnutrition and undernutrition are significant contributors to infant mortality and poor health outcomes which can have long lasting consequences. Livestock-derived foods contain both micronutrients and essential amino acids and proteins and can be a highly efficient way of fulfilling this need. Though other foodstuffs can fulfil the same needs, such diverse foodstuffs are often unavailable or unaffordable to the poor.

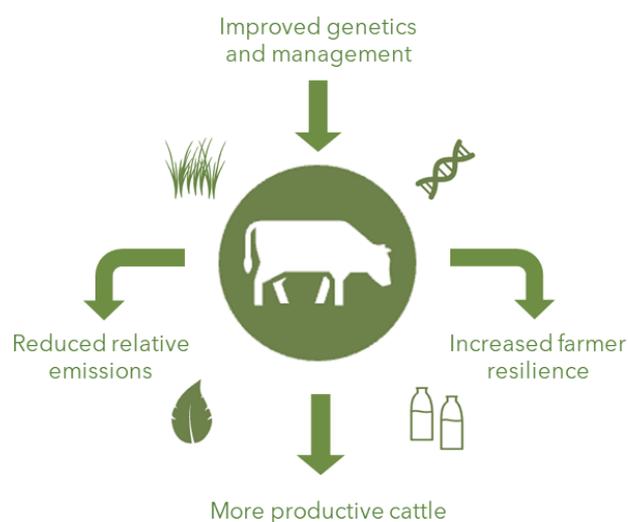


In poorer rural areas, dairying also represents an alternative to less environmentally friendly livelihoods sources such as slash and burn agriculture or exploiting forest resources. Cattle can be grazed on land unsuitable for cultivating food crops and they also create manure which can be used as environmentally friendly and low-cost fertiliser.

A common question we receive is why we focus on dairy rather than other agricultural value chains. Livestock agriculture, and specifically dairy farming, is a massively expanding sector in sub-Saharan Africa, and one in which the Island of Jersey has valuable expertise.

Our projects intentionally target areas with large existing cattle populations and centuries-old traditions of dairy farming. However, they also suffer from challenges of high rates of poverty and malnutrition, and limited job opportunities in rural areas. These areas (Rwanda, southern Malawi, and central Ethiopia) are well suited to dairying, having (relatively) mild climates and being some of the most densely populated regions in Africa, with labour relatively abundant compared to land. Strengthening the dairy sector to meet development challenges does, however, risk creating negative impacts if sustainability is not a key consideration. In recent decades, advances in dairy practices and technology have led to increased production efficiency in developed industries with larger but fewer herds. However, production and efficiency increases have lagged behind in developing countries.

Our input focuses on improving the genetics and management practices of smallholder dairy farmers, to improve their productive efficiency as well as the health and welfare of their cattle. The Jersey breed's small size and feed intake relative to productive output is a significant advantage for farmers with limited resources, and the productive efficiency and small stature of Jerseys and Jersey-cross animals both reduces GHG emissions relative to production and the relative feed and water requirements to produce a given volume of milk.



Increasing the use of appropriate practices, technologies and animal genetics can all play a part in reducing the intensity of emissions and increasing efficiency of production, ultimately reducing the environmental impact. In the areas we work in, a farmer with a healthy, productive cow is likely to earn a higher and more stable income than farmers growing crops, and to be more resilient to external shocks such extreme weather or economic downturns. If populations are better able to support and feed themselves and build up savings and assets in the form of appropriate dairy cattle, their vulnerability to climate change is reduced.

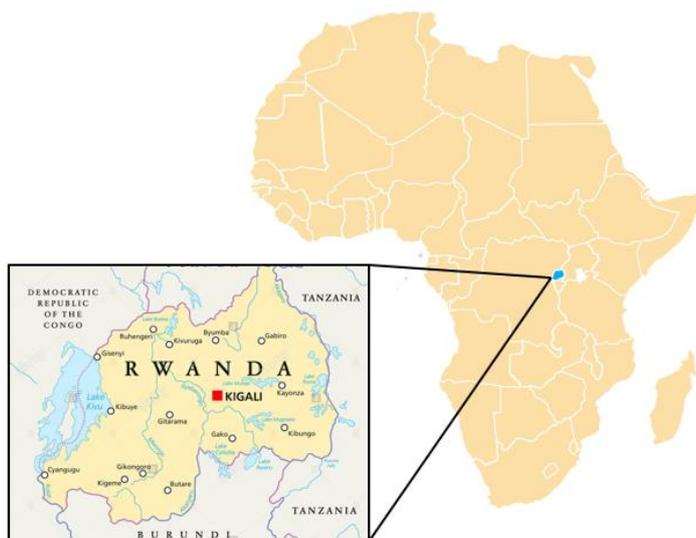
Jersey Inka Nziza ('Jersey Good Cow') – Rwanda

The history of the Society's connection with Rwanda dates back to 2004, when a delegation from the Government of Rwanda first visited Jersey to discuss the possibility of a collaborative effort to cross-breed the predominant Rwandan cattle breed, the Ankole, with Jersey cattle genetics. The rationale was to improve productivity, as the pure Ankole produces a relatively low average daily milk yield of 1 to 2 litres. Trials undertaken in Rwanda established that by cross breeding the Ankole to the Jersey, milk yields could be substantially increased whilst maintaining an animal that was suited to the environmental conditions in the country. The first crossbred animal (i.e. 50% Jersey and 50% Ankole) was able to produce an average of 12 litres of milk per day. The second cross (75% Jersey and 25% Ankole) produced an average of 16 litres of milk per day. The potential for improving the profitability of dairying in Rwanda was clear.

This meeting would begin an ongoing collaboration that has grown in scale in recent years. Between 2005 and 2009, a retired Jersey Artificial Insemination (AI) technician was regularly deployed to Rwanda, and provided training to establish over 370 AI technicians from an original pool of only 19. The Government of Rwanda began the Girinka programme, which would purchase and distribute dairy cows to needy families, who in turn provide their cow's first offspring to another family. By 2018, the Girinka programme had provided over 300,000 families with dairy cows, and annual national milk production had increased nearly six-fold between 2006 and 2017.



Above: Genetically sampling indigenous Ankole cattle as part of our research



In 2016, the Society partnered with Send a Cow, an international NGO already working with over 10,000 low-income farmers in Rwanda, to design a project that could reach smallholder dairy producers with training and technical support at scale. This would see Jersey Overseas Aid funding its first ever multi-year >£1m project grant in 2017, for the Jersey Inka Nziza ('Good Cow') project. Jersey Inka Nziza's work expanded awareness of the Jersey breed in beneficiary farmers to 100% and increased the use of AI services from 22% to 96%, with 87% using Jersey semen. The project also achieved a 48% increase in monthly milk yields and a 50% increase in the proportion of farmers selling milk through formal channels.

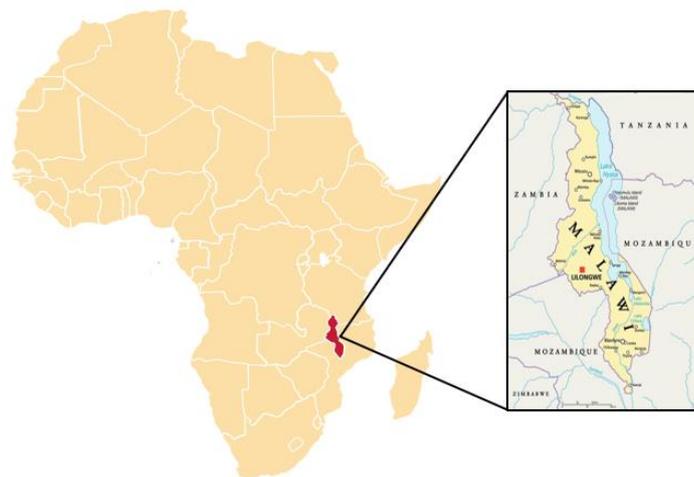
Jersey Inka Nziza is now in its second phase (2019-22), working with an expanded group of partners. Collaborating with the Centre for Tropical Livestock Genetics and Health (CTLGH) of Edinburgh University, and Pan Livestock of Reading University, Phase II is launching a trial national cattle database, and conducting genetic sampling and market research to build a profile of the most profitable dairy cattle genetic profile for the Rwandan context. In line with Phase I, Phase II continues Send a Cow's work with smallholder farmers, providing training and extension services for cattle health and fertility management, gender and social inclusion support, and improved facilities for fodder production and cattle housing.

Scan this QR code to see the project in action:



Malawi Dairy Growth (MDG) Project

The Society currently oversees the three-year Malawi Dairy Growth (MDG) Phase II project (2021-24) with the support of Jersey Overseas Aid. The MDG project works through implementing partner the Shire Highlands Milk Producers Association (SHMPA), a dairy farmers association active in Southern Malawi, the country's main milk producing region. SHMPA's membership of over 10,000 accounts for over 90% of raw milk sold in Malawi, with membership providing farmers with the benefits of connection with milk processors and support with farm inputs (such as fodder and health products), as well as extension support such as vet treatments and breeding services.



The Society provides SHMPA's team with technical and management support in implementing a three-year project aimed at improving their farmers' productivity and incomes, and expanding the reach of Jersey genetics in the Malawian dairy cattle population. Now in its final year (2020-21), the project has so far trained over 7,000 dairy farmers in cattle health and fertility, farm management, and selection of appropriate genetics, and also expanded awareness of Artificial Insemination (AI) and genetic selection. Within SHMPA, 38 field staff have received regular training, and have been supplied with new equipment to ensure they can provide high quality extension services - including AI, all of which is now carried out using Jersey Island semen, reaching 2-3,000 farmers per year.

The project's Mkakazi ('Milk Women') loan scheme supports vulnerable women farmers with the cost and inputs required to establish a viable dairy farm. Provided with an 'in-calf' heifer or cow, loan farmers are expected to 'pay it forward' by offering the next born calf to another farmer in need. Over 3,500 of SHMPA's membership have benefited from this scheme, of whom over 800 have been directly supported by the MDG project so far.

Crucially, gradual improvements in cattle fertility and health management, and genetic gains, have reduced the average inter calving interval of the SHMPA herd by over 60 days. Each day that the project can deduct from the calving interval saves an individual farmer \$2 per day, amounting to an annual saving of \$120 per year. Data collected on milk production and other characteristics of the various cross-bred cattle merging from the project will provide valuable insights for dairy cattle management and breeding strategies, to benefit smallholder farmers across the wider region.



Above: Meeting farmers to discuss current challenges



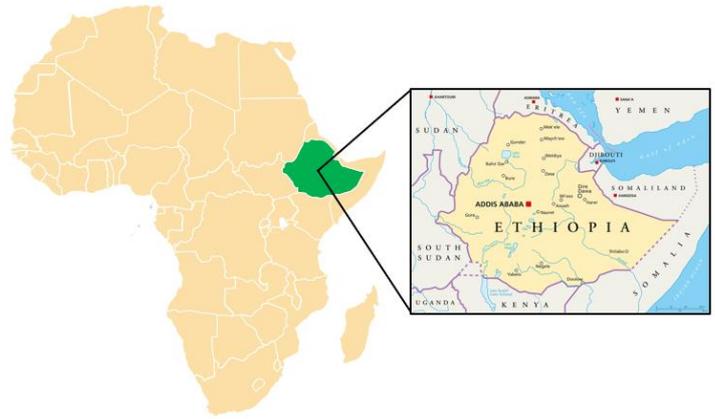
Above: Jersey-sired calf born at SHMPA's heifer rearing farm

Ethiopia Dairy Project

The Society is currently implementing a three-year project (2020-23) in Ethiopia, funded by Jersey Overseas Aid (JOA) and implemented with project partner Project Mercy Inc. Our work in Ethiopia aims to promote, expand, and integrate the Jersey breed into smallholder farming practices to increase the quality and quantity of milk produced, consumed, and marketed, with a focus on female headed households.

The Society's newest Dairy for Development project works in the vicinity of Cha Cha, a town in the Amhara region of Ethiopia approximately 100km northeast of Addis Ababa. The intended impact is to provide better nutrition for children at home and an estimated four-times increase in income per household from the sale of dairy products for beneficiary farmers. In time, it is also hoped that this initial project will serve as a model which can be adapted and replicated at a larger scale throughout Ethiopia.

Working with Project Mercy's existing cattle breeding facility, the project will reach 4,500 smallholder farmers with promotional knowledge and material, will expand the number of smallholder farmers with at least one Jersey crossbred animal from 130 to 950, train and deploy 50 community-based Jersey breed exposed extensionists, and place 15+ Jersey bulls in a community breeding programme. The project will also provide demonstration and training to 450 smallholder farmers on improved dairy production and management. Genetic and productive data gathered through this project will also support the Society's regional work with CTLGH and Pan Livestock, contributing to enhanced knowledge on the most desirable genetic traits for smallholder dairy farmers in the East African region.



Following discussions between JOA and the RJHS it was mutually agreed to delay the launch of the project by three months due to disruption caused by the COVID-19 pandemic, from a planned start date of March 2020 to begin in July 2020.

Following its launch, the project has carried out a variety of stakeholder engagement and education activities in the local area and wider region. This has included providing training and awareness raising sessions with over 200 local livestock development experts and 14 technical and vocational education college students, hosting seven NAGII staff and six local university staff for study visits, and hosting an inception workshop with 13 Kebele (Village) Administrators, 13 Kebele Heads of Agriculture, and 13 Kebele Livestock Development Agents, from the 13 Kebeles in the project area.

The project has also this year (2021) identified, trained and equipped 19 local AI techs to provide AI services with improved genetics in the target communities. Genetic samples have also been collected from 454 cattle including Project Mercy's own herd and a variety of cattle of different breeds from the surrounding area, to support our efforts in establishing the ideal genetic profiles for dairy cattle in specific environments.



Above: Local / Jersey crossbred cattle grazing



Above: Newly graduated AI technicians

Jerseys in Africa

Africa is the second largest continent by land area, with a population of over 1.3 billion people, predicted to reach 2 billion in just 20 years' time. As the continent's population expands and urbanises, and incomes increase, the demand on livestock systems, and specifically dairy farmers, will also increase. Despite its humble origins, the Jersey breed has a key role to play in this process. Jersey cattle have been exported internationally since the 1700s, with the first recorded sale into Africa (to South Africa) occurring in 1877. The Jersey has proved remarkably adaptable and profitable in a range of different environments as evidenced by the fact that records show a current or historical presence of Jerseys, in pure or crossbred form, in at least 34 African countries as outlined below:



Above: Jerseys graze alongside indigenous Ankole cattle at Songa Research Station, Rwanda

There is a huge diversity of cattle species native to the African continent, evolving over centuries to play not only a role in providing food and income but also holding deep cultural significance in many cultures. These breeds have proved remarkably resilient in adapting to extreme environments, from the arid fringes of the Sahara Desert, to the tropical wetlands of West and Central Africa, to the savannahs of East and Southern Africa.

In terms of milk production however, productivity of indigenous African breeds is relatively low, ranging from 0.5 litres to a maximum of 6 to 8 litres per day. By contrast, exotic breeds such as the Jersey can perform at much higher levels, but often do not exhibit their full genetic potential in African systems due to environmental conditions and less than optimal management.

Traits of the Jersey breed such as productivity, fertility, heat tolerance, and feed conversion efficiency, lend themselves to many environments. In Africa, many of these traits have been targeted through specific cross-breeding programmes with native/indigenous cattle breeds, with recent scientific research lending weight to the suitability of the Jersey as the 'exotic' breed of choice for Africa (see 'Why Jersey').



Above: Jersey cross calf suckles from its Zebu-type dam at Mpemba farm, Malawi



Above: Jerseys from the Anglesea herd, southern Zimbabwe

Why Jerseys?

Recent scientific research has provided weight to an increasing volume of evidence that supports the Jersey breed's value in improving incomes and food security for resource poor smallholder dairy farmers and their families in developing economies. With the Jersey, we have an animal that is smaller, uses fewer natural resources, and produces a smaller carbon footprint, relative to larger 'exotic' breeds such as the Holstein-Friesian. In this same animal, we have a dairy cow with a longer productive life that produces more nutrient-rich milk.



Above: Jerseys have proved adaptable to a range of conditions

Jersey cattle, and more specifically their primary breed characteristics, therefore have a potentially significant role in emerging dairy industries which are expected to emerge to meet growing market demand in developing countries in coming decades. Fertility and productive benefits in Jersey-infused genetics stand to benefit smallholders' productivity and incomes, and crucially a high feed conversion ratio both lowers the relative feed inputs required to produce the same quantity of milk and reduces the intensity of Greenhouse Gas (GHG) emissions.

As David Hambrook, General Manager of Jersey Island Genetics, and Head of International Dairy for Development at the RJAHS phrases it...

Comparing a Jersey to a Holstein-Friesian is like comparing a Toyota Corolla to a Lamborghini. While a Holstein-Friesian may produce more milk outright in comparison, it will do so at a much greater cost of feed, and a greater cost of care than a Jersey. Like the rugged, fuel-efficient Toyota, a Jersey is more efficient at converting input to output, and will continue doing so with less intense management. There's a reason you see a lot more Toyotas in rural Africa than Lamborghinis!

Jersey's position as a centre of expertise in Jersey cattle breeding, and dairy industry development more broadly, provides a significant resource for delivering impact further afield.

Specific to an African context, there are a number of traits of Jersey cattle that are beneficial to both smallholder and commercial farmers, which provide advantages over other exotic breeds:



Jerseys are the most heat-tolerant of the European 'pure' dairy cattle breeds.

Because of its smaller size, a Jersey cow requires less feed to produce every litre of milk than a larger cow, especially in a smallholder environment.



Due to their compact size, Jerseys take up less space for both housing and grazing than larger breeds. This leads to significant reduction in costs to the smallholder farmer

Of the European 'pure' dairy cattle breeds the Jersey is recorded as having a greater degree of tick-resistance.



Jerseys mature quicker, reach reproductive age and come into milk production sooner than other breeds, reducing rearing costs.

Jerseys produce large volumes of milk, with high butter fat and protein content, making it suitable for processing into a wide variety of nutritious food stuffs.



Jerseys have good fertility and are less prone to calving issues. Fewer calving problems reduces worry, labour and veterinary costs.

The confident nature of a Jersey means they coexist well with larger breeds.



Because of its feed conversion efficiency, a Jersey cow also supplies quality solid and liquid manure for use on vegetables and other crops.

Jerseys are naturally intelligent and renowned for their docile nature and ease of temperament.



While a 100% pure Jersey may not be the ideal animal for all farmers in Africa, targeted crossbreeding, conserving indigenous traits such as disease resistance, has proved successful in multiple management systems. The RJAHS, through our African projects and partnerships with other organisations, is carrying out research to help determine appropriate breeding strategies for specific environments.

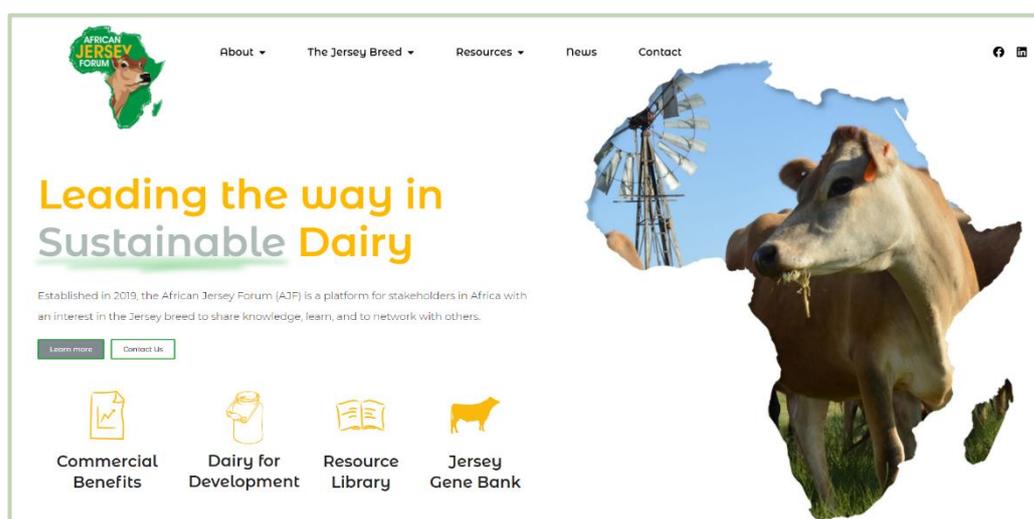
The African Jersey Forum

Alongside country-focused projects, the Society works with Jersey Overseas Aid (JOA) and our other partners on a number of cross-cutting projects. In 2019 we jointly launched the African Jersey Forum to promote regional cooperation and coordination in our efforts and those of other donors and actors in the Jersey breed led elements of the African dairy sector. We have a joint long-term vision of promoting awareness of and research into the Jersey breed as a solution to the challenges of increasing African dairy profitability and productivity in a sustainable manner. The Forum is intended to act as a platform to facilitate this vision, and is established in collaboration with the World Jersey Cattle Bureau (WJCB), as the international umbrella organisation of national and regional Jersey breed associations.

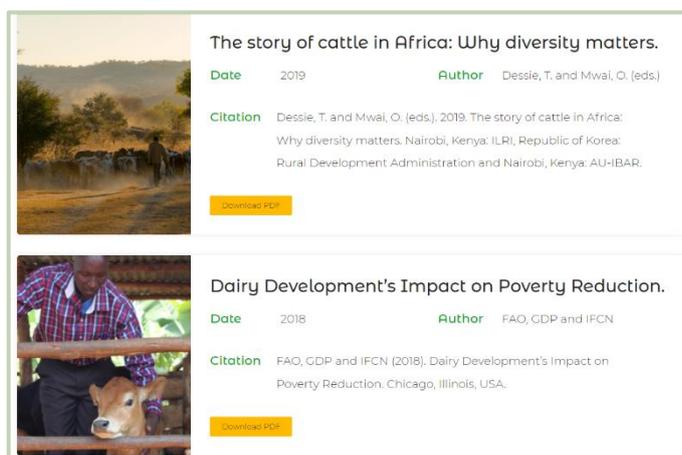


Inspired by existing regional platforms including the European Jersey Forum and Latin America Jersey Forum, the Forum is intended to serve a dual purpose. Firstly, to provide educational and promotional resources for various audiences (including farmers, researchers and policy-makers) related to the Jersey breed, and dairy development more broadly, throughout Africa and the tropics in general. Secondly, to bring together national Jersey breed associations as they begin to emerge in the region. Recently, the Society has designed and launched an African Jersey Forum website which can be accessed at www.africanjerseyforum.com.

Scan this QR code to access the website:



The website is a platform for sharing a variety of content including scientific articles and reports, news and insights. Our intention is that, over time, the forum will develop an extensive library of resources and a network of users throughout the region, promoting the Jersey breed and its benefits and providing useful information to farmers and others involved in emerging dairy industries across Africa.



The website also profiles our various partner organisations, who you can also learn more about overleaf....

Our Partners:



Jersey Overseas Aid

Formed in 1968, Jersey Overseas Aid (JOA) is an international aid agency funded by the States of Jersey. As well as funding for humanitarian assistance in emergencies, JOA funds projects targeting sustainable development in three targeted focus areas – Dairy for Development, Financial Inclusion, and Conservation Livelihoods. JOA currently funds the entirety of the Society's overseas development projects.



Rwanda Agriculture and Animal Resources Development Board (RAB)

The Rwanda Agriculture and Animal Resources Development Board (RAB) is an autonomous agency of the Government of Rwanda, focused on development of the national agricultural sector. The Society partners with RAB along with Send a Cow on the Jersey Inka Nziza Phase I & II project with RAB providing support with extension, training and research activities and ensuring that activities are aligned with government priorities and other initiatives for agricultural development.



Send a Cow

Send a Cow is an INGO (International Non-Governmental Organisation) established in the UK in 1988, which focuses on supporting smallholder farmers, and works throughout East and Southern Africa. The Society has partnered with Send a Cow in Rwanda since 2017, as the main implementing partner on Jersey Inka Nziza (Phases I and II).



Shire Highlands Milk Producers Association (SHMPA)

Shire Highlands Milk Producers Association (SHMPA) is a dairy producers cooperative of over 10,000 farmers, who supply over 90% of Malawi's domestic milk supply. The RJAHS has worked with SHMPA since 2018 as the key implementing partner in our Malawi Dairy Growth project (Phases I and II).



Project Mercy Inc.

Project Mercy is a US-headquartered and Ethiopia-based NGO, first established in the 1970s. Originally a humanitarian relief organisation, Project Mercy's remit has since expanded to include health and education projects, as well as a dairy programme which is now partly funded through partnership with the Society and JOA.



Centre for Tropical Livestock Genetics and Health (CTLGH)

CTLGH is an international research collective formed as a partnership between the Roslin Institute of the University of Edinburgh, the International Livestock Research Institute (ILRI), and Scotland's Rural College (SRUC). The RJAHS partners with the Centre for Tropical Livestock Genetics and Health (CTLGH) in our overseas work in dairy cattle genetics.



PAN Livestock Services Limited

PAN Livestock Services Limited (PAN) has close academic links with the Veterinary Epidemiology and Economics Research Unit (VEERU) at the University of Reading. The Society is partnering with PAN in our work on livestock data systems, including in Rwanda where PAN is providing technical support to develop a national cattle database.



UdderWise

UdderWise is a UK veterinary consultancy run by experienced vet and mastitis expert Dr Peter Edmondson. UdderWise provides technical advice in cattle health and management to our Ethiopia and Malawi projects.



Our Dairy for Development projects benefit from high quality Jersey genetics, much of which is sourced from top locally-bred bulls including:



Ansom Animate



Supreme Vedas Senator

