

Artificial Insemination in Rwanda: Exploring Opportunities, Overcoming Challenges | Paul Chatikobo, Rwanda

Rwanda is not only a country of a thousand hills; it is also a country of a thousand opportunities and challenges for dairy development. Artificial insemination using high quality bull genetics, and improving milk hygiene and quality are some of the major production and market access enhancement activities being undertaken by EADD. In this article we highlight the Rwandan experience with regards to AI and its intake. We also give an in-depth insight on why AI is good for the country and highlight the best AI strategies applicable.

Why Artificial Insemination is Good for Rwanda

The target for EADD is to improve dairy production for smallholder farmers who earn less than US\$2 per day. The entry point into dairy production is a dairy cow. A large majority of farmers in the target project districts in Rwanda own indigenous breeds of cattle whose milk output is extremely low, typically less than 4 liters per cow per day. This certainly does not qualify them as dairy cows. For owners of such cows to meet their household milk needs and have some surplus for sale to improve their income, each farmer would have to own and manage a very large herd. A preliminary survey conducted by EADD in the first year of project implementation shows that many households own upward of 20 herds and even up to over 100 cows. Such a large herd would require large areas of land to satisfy the animals feed requirements. Further, and on account of the hilly nature of the country's topography, water for livestock is scarce by any measure and pasturelands as well as quality of feed available are very limited.

Unfortunately for Rwanda, about 9 million citizens share a surface area of 26,338 Km² (inclusive of areas under water), resulting in a high population density of around 340 people per square kilometer, one of the highest in Africa. On account of the high population density, land is a very scarce commodity. With the exception of the Eastern Province (EADD's operational zone), average size of farming land per household for the rest of the country has shrunk to about 0.76 ha. However, recently, the Rwandan Government adopted a new land policy which is working towards reducing landholdings in the Eastern Province to a maximum of 25 hectares per household encourag-

ing families with large herds to cut down and intensify their production. Maximizing production per unit of land requires adoption of new technologies such as artificial insemination to improve and match the quality of animals for milk production.

All these presented tremendous opportunities and incentives for genetic improvement of the cattle breeds so farmers can reduce their numbers of animals while improving their output of milk. A poor smallholder farmer in Rwanda has two options when it comes to genetic improvement of their cattle. The first option is to use natural breeding. Natural breeding requires the farmers to have access to both male and female livestock. Under such circumstances, normally only a few males breed most of the females leading to inbreeding. Leaving the breeding to the livestock lets nature take its own course at best results average-producing animals. Artificial insemination is the second and best option for smallholder farmers in the target project areas. Artificial insemination is well suited to improving herd performance. It also permits the farmer to select the ideal male to mate with each female on the farm.



AI trainees in Rwanda during a pregnancy diagnosis exercise - photo by Paul Chatikobo

Another advantage of AI to the farmer is reduced costs associated with not keeping males on the farm. Some small farms may only have three or four heads of cattle, and under such circumstances, AI can be several

times cheaper than keeping a bull year-round for such small herds. Further, bulls have the added disadvantage of spreading reproductive diseases such as brucellosis which causes infertility in cattle further derailing the process of genetic change. A recent study by EADD shows that the prevalence of brucellosis in the project area ranges from 12-20%, average 9.75%.

In Rwanda, like anywhere else, successful AI programs require patience, a thorough understanding of bovine reproduction and attention to detail. It requires special training. At the start of the project, EADD trained inseminators from all the three districts in proper insemination techniques. Further, this quarter EADD ran a refresher course for artificial insemination service providers (AISPs) on semen handling.

EADD-Government of Rwanda Partnership

EADD's AI component fits well with the Rwanda government's policy of rapid breed improvement through cross-breeding with exotic quality bulls. EADD is working very closely with the Rwanda Animal Resources Development Authority (RARDA), whose mandate is to contribute towards the growth of animal production through the development of appropriate technologies. The Government of Rwanda realized the tremendous power of artificial insemination in achieving its desired goals and embraced AI as a breeding technology more than a decade ago. This has seen tremendous gains in milk production.

The Challenges

The difficulty with AI is the level of herd and semen management required. An AI program can fail in several ways. The first is incorrect heat detection. Identification of cattle in heat is critical especially in large herds as with the case in Rwanda. The farmer must closely monitor those cattle exhibiting estrus to decide when they are in standing heat and ready to breed. Ear tagging when done properly, is foolproof cow identification procedure.

A recent study by part of the EADD team shows that in the operational zone, only 6% of the farmers are able to correctly pin point true estrus (heat) in animals. This is a major challenge which weighs down on AI following natural heat detection. The challenges of heat detection in the project area gave further impetus for EADD Rwanda to adopt synchronization and time breeding to avoid the inefficiencies associated with poor heat detection.

Careless semen handling is the second way AI can fail. The bull semen must be stored, transported and thawed correctly to ensure it remains viable. The third area is im-

proper insemination technique. Lack of handling facilities makes it difficult for the inseminators to follow proper semen handling procedures and times. Proper training and experience are necessary to be successful. The farmer often overlooks the last area. Record keeping is important for following individual cows' cycles, birthing dates and missed breeding. EADD has so far trained 336 farmers in record keeping.

Synchronization vs. Natural Heat Detection

The Rwanda Government is anxious to see a rapid change over from indigenous animal type to exotics of any level. This has resulted in the country adopting a strategy of using hormones for estrus synchronization and artificial insemination, though it is more expensive compared to natural heat detection. The aim is to get as many improved breeds as possible in the shortest possible time. Basing on experiences of the first year of project implementation where on average, not more than 300 inseminations were achieved per month using natural heat detection, EADD Rwanda had to adopt synchronization and timed AI as a breeding strategy to go along with the government's initiative, and avoid undue competition. However, synchronization was not part of the initial project strategy, and this has called for a review of the budgetary allocations for animal breeding. Implementing artificial breeding program with indigenous cattle managed under open uncontrolled natural grazing lands and with farmers possessing little or no knowledge of animal science is a very costly exercise

Why Synchronization Works

EADD has joined hands with Rwanda Animal Resources Development Authority (RARDA) and Eastern Region Animal Genetics Improvement Co-operative (ERAGIC) to guarantee the best opportunity for success. Synchronization is an excellent tool to improve performance and the overall value of a herd and the subsequent calf-crop.