CASE STUDY 1: Mass artificial insemination for Ethiopian cattle

Ethiopia boasts the largest number of cattle in Africa, but millions of Ethiopia's cattle owners struggle to improve the number of female calves their cows birth as well as their milk producing capacity. This is due in part to a deficient breeding system incapable of meeting demand. Currently artificial insemination (AI) technicians must travel door to door and are only able to inseminate an average of 3 cows per day. In many cases, they arrive too late in the cow's oestrus cycle and insemination cannot take place.[1]

Mass artificial insemination Ethiopia. Credit, CGIAR

The 'Improving Productivity and Market Success of Ethiopian Farmers' (IPMS) project operated in 4 regions of Ethiopia from 2005-2012 with the aim of providing 'mass insemination.' Funded by the Canadian International Development Agency (CIDA), IPMS was a research for development project implemented by International Livestock Research Institute (ILRI) in partnership with the Ministry of Agriculture (MoA) of Ethiopia[2] as well as Regional Agriculture Bureaus and Livestock Agencies. The 'mass insemination' model brings cows to the technicians instead of bringing the technicians to the cows. By informing farmers about the benefits of AI and encouraging them to bring their cattle to a central location then synchronising their oestrus using hormones to better ensure fertilisation, thousands more cows can be inseminated with improved varieties and sexed semen to increase the female cattle population.

In total 1,400 cows in Tigray and the Southern Regional State received AI. 95% of the cows responded positively to the hormone treatment to synchronise oestrus, and there was a resulting conception rate of 65%.[3] Using X-bearing (female) sexed semen has resulted in the breeding of 90% female calves. Improved cows sell in Ethiopia for between ETB 18,000-20,000 (about US$850 – US$1,000).

Kebeat Halform, a female farmer who participated in the programme, explained that her improved cow produces around 17 litres of milk per day selling for about ETB 140 (US$6.5). Each month, Kebeat earns around ETB 3,000 (almost US$150) that is enough to cover her feed costs and leave her with a profit. Her cow just gave birth to a female calf. She expects to be able to produce more milk, yoghurt and butter that will enable her to school her children and save money.[4]

CASE STUDY 2: BRAC Artificial Insemination programmes

Credit, Conor Ashleigh USAID

In 1987, the charity BRAC (formerly the Bangladesh Rehabilitation Assistance Committee) started working with the Government of Bangladesh's Livestock Department on a vaccination programme that trains para-vets (veterinary assistants) from rural communities who will then serve farmers in their local area.[5] In 2000, the BRAC Bull and Buck Station in Mymensingh, central Bangladesh, started producing frozen semen from high-quality breeds as part of their Artificial Insemination (AI) programme. The programme trained para-vet entrepreneurs in AI techniques, so they can provide farmers with access to semen of hybrid cattle breeds that yield more milk, along with training on how to care for their livestock. They are also offered access to loans, quality supplies, on-going supervision and refresher training, so that the entrepreneurs can successfully provide services that help support rural farmers.

By 2014 the AI programme employed about 60 staff and has trained more than 2,200 AI entrepreneurs who charge local farmers BDT 180-200 (US $2-$2.5) per cow for the service. In addition to producing more milk, local cow breeds sell for BDT 16,000 (US $204) while the high quality breeds can sell for BDT 100,000 (US $1275). More than 1,400,000 cattle were successfully inseminated in 2014.[6] One dairy farmer, Marium, now owns 7 cows and several calves, all of which are from artificial insemination. She says of her milk that "now... we get the best possible price. The BRAC AI worker helps us look after our cows"[7]

CASE STUDY 3: IRAD Bambui Regional Centre, Cameroon

Loading pipette with chilled semen. Credit, Bayemi

Much like other African countries, demand for milk and dairy products is on the rise in Cameroon. Indigenous breeds, all zebu cattle, make up the majority of milk-producers in the country. As these breeds are 'poor milkers' producing about 500kg of milk per lactation, they cannot meet demand. Exotic breeds such as Hostein and Jersery produce around 12 litres per day by comparison.

The need to improve the milk producing capacity of the local herd, led to the establishment of livestock research

programmes at the Bambui and Wakwa Centres of the Institute of Agricultural Research for Development (IRAD). The Centre determined that artificial insemination (AI) would be an effective means of achieving this goal. As the only functional AI centre in the Central Africa Region, the centre supports AI services in the Republic of Chad, the Republic of Central Africa, Gabon, Equatorial Guinea and the Congo Republic, because they keep the same cattle breeds as Cameroon.

IRAD Bambui continues to use semen from Holstein-Friesian bulls, originating from northern Europe, to crossbreed with local cows so as to improve the dairy potential of the resulting crossbreds and increase heterosis (when a crossbred individual shows qualities superior to those of both parents). Semen collected from the bulls is evaluated, processed and chilled for subsequent use. This is the first in a series of steps to introducing frozen semen. Previous attempts were unsuccessful because the price of liquid nitrogen was nearly US$30 per litre. With government support for a scheme to reduce the cost of obtaining liquid nitrogen, it could be more easily distributed throughout the country. However, improving the breeding system in Cameroon and its central African neighbours will also require organizing breeding societies, empowering research institutions to multiply valuable offspring for improving dairy production as well as stabilising Cameroonian dairy breeds that are well adapted to local conditions.[8]

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[1] More money, milk and meat: Promoting mass artificial insemination for Ethiopian cattle, 2014 (video file), Available from: <https://youtu.be/TgAbC2v0zKo> [7 July 2015].

[2] IPMS 2013, *Video: IPMS Ethiopia – Project approaches and experiences, 2015-2012*, Available from: <https://ipmsethiopia.wordpress.com/category/ilri/> [7 July 2015].

[3] More money, milk and meat: Promoting mass artificial insemination for Ethiopian cattle, 2014 (video file), Available from: <https://youtu.be/TgAbC2v0zKo> [7 July 2015].

[4] More money, milk and meat: Promoting mass artificial insemination for Ethiopian cattle, 2014 (video file), Available from: <https://youtu.be/TgAbC2v0zKo> [7 July 2015].

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[8] Bayemi, PH 2012, *Science and Technology for Livestock Value Chain Development: A Focus on Artificial Insemination*, Available from: <http://knowledge.cta.int/Dossiers/Commodities/Dairy/Feature-articles/Science-and-Technology-for-Livestock-Value-Chain-Development-A-Focus-on-Artificial-Insemination> [7 July 2015].