

Some Success Stories of Animal Biotechnology

Embryo transfer technology:

The department initiated a mission mode programme to enhance the productivity of livestock and emphasis was given on standardization of various techniques of Embryo transfer technology (ETT). The technology was successfully standardized in cattle, buffalo, goat, equine, camel, mithun and yak. The department established three main ETT centre and 14 regional ET labs in different parts of the country. Various techniques viz. super ovulation, in vitro culture of embryos, embryos transfer etc. were standardized. ETT demonstration activities were undertaken at the farmers level and a number of cattle and buffalo calves were produced. With the help of ETT an intensive selection among male and female livestock can be carried out in elite herd at an early age using the family information and thus reduce the generation interval and bring about desired change in short span of time. Now the Department of Animal Husbandry and Dairying (DAHD) is establishing 10 ETT centre across the country using the technology developed by DBT.

Open nucleus breeding system:

The department initiated Open nucleus breeding system (ONBS) for enhancing the productivity of Sahiwal and crossbred Sahiwal cattle at National Dairy Development Board (NDDB), Anand. The nucleus was established from the best animals obtained by screening the base population. During the project duration, 268 male calves and 259 female calves were produced through embryo transfer. It was estimated by NDDB that the value of milk produced by the cows which were born through the semen of bulls supplied produced during the project duration around Rs. 5000-Rs.6000 crores with actual net benefit of Rs. 700-Rs.800 crores to the farmers. This programme was adopted by NDDB, Anand for continuous production of male Sahiwal and crossbred males for National Artificial Insemination programme.

Development of Transgenic Animal:

Techniques for developing transgenic animal (mice model) was standardized and a large number of transgenic mice lines were developed which has application in studying physiological, pathological processes of human diseases and also development of therapeutics and recombinant proteins. The technique for production of transgenic model animal is being routinely used for the production of model animal for various human diseases.

Genetic Improvement:

Genetic improvement of local sheep breed of Kashmir and Maharashtra using Fec B mutation and their genetic characterization were carried out successfully. Approximate 45% more lambs were produced by the heterozygous ewes having Fec B mutation whereas homozygous ewes gave birth to 65.5% more lambs than non carriers ewes. The study confirmed two distinct groups among FecB carrier crossbred ewes with low and high average litter size. Department of Animal Husbandry, Govt. of India has adopted this programme and a national programme on genetic improvement of sheep breeds was launched.

Cattle Genomics:

Department has initiated a major programme on genome sequencing of indigenous cattle breeds. The aim of programme is to develop high density(HD) and low density (LD)SNP chip representing SNPs of all indigenous cattle breeds. The study will help in conservation, identifying pure elite indigenous cattle breed at an early age as well as prediction of breeding value of animal required for selective breeding. The study will help in enhancing productivity of indigenous cattle breeds.

Reconstituted collagen sheet (RCS):

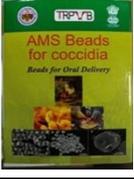
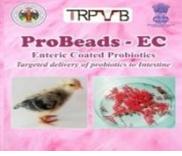
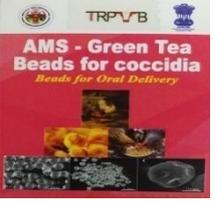
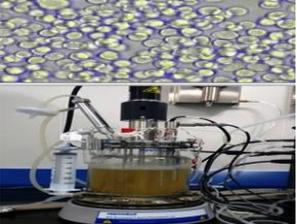
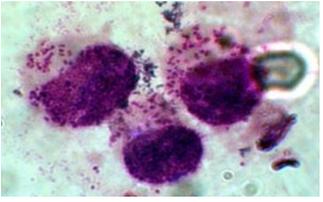
A new process for conversion of the Achilles tendons of the bovine origin into reconstituted collagen sheet was developed and named as RCS. This has application in wound healing and technology was transferred to M/s Eucare Pharmaceutical Pvt. Ltd., Chennai.

Brucella delta S 19 vaccine:

Department has successfully completed a network programme on bovine brucellosis in which an improved brucella vaccine viz. modified delta S 19 vaccine has been developed. Safety and potency of delta S 19 vaccine has been done in mice model and also evaluated successfully in buffalo. Delta S19 vaccine is more safe in comparison of existing vaccine without any side effect. Industries have shown interest in technology and efforts are on to transfer the technology.

TRPVB: List of Products ready for commercialization

1.	2018	<p>Nano Ivermectin spot on</p> 	<p>This is novel nano-technology based Ivermectin Spot-On that can be applied for dogs. Ivermectin is a member of the macrocyclic lactone class of parasiticides. It is commonly used as a heartworm preventative in small animals and for the treatment of certain types of external (e.g., mites) and internal parasites in dog infestations with ticks, fleas, mites and lice.</p>
2.	2018	<p>Sure Heal</p> 	<p>Sure heal is a collagen base wound healing base encapsulated with Gentamicin Sulphate for animal dermal applications is an unique combination of non-toxic and biocompatible ingredients that exerts multilevel antibacterial and antifungal effects which also enhances the re epithelialization, reduced inflammation, applied for oozing wound.</p>
3.	2019	<p>Nano Herbal Methicon Lotion</p> 	<p>Nano Herbal Methicon lotion is formulated especially for companion animals. The active compound, Dimethicon oil and poly herbals are encapsulated in nanoform to increase their stability and minimize the dosage. This lotion is useful for the control of external parasites (ticks and Lice) and this lotion provides relief of irritation from dermatosis, such as allergic contact dermatitis.</p>
4.	2018	<p>ABT Detect</p> 	<p>A simple, ready-to-use broad spectrum microbial screening assay kit containing freeze dried <i>Geobacillus stearothermophilus</i> as test organism was developed for preliminary screening of antibiotic residues in meat and milk samples.</p>
5.	2019	<p>Pan ABT detect</p> 	<p>Antibiotic residue in meat is a most important health concern due to its harmful effects on health of consumers. There are different classifications of antibiotics used in poultry farms, continues use of antibiotics leads to presence of trace amount in meat. ABT Pan Detect kit quantitatively detects the antibiotic residues present in the sample by colour reaction. Bacterial growth aids in color change from blue to yellow,</p>
6.	2019	<p>Ketoquant</p> 	<p>Ketoquant, a rapid sensitive detection kit for ketosis is a colorimetric test which measures ketone bodies. It is an enzyme based test that accurately detects ketone bodies in any biological sample. It is point of care diagnostic kit for the detection of increased ketone bodies that appear in the early lactating cows.</p>

7.	2018	<p>Metrozinc Gel</p> 	<p>Metronidazole gel prepared as a topical preparation (applied to the skin) of the antibiotic metronidazole and zinc oxide in the final formulation. It is an antibacterial and antiprotozoal formulation found to be effective against anaerobic bacterial infections including clostridium and fusobacterium species. It is used for reducing the swelling and redness caused by acne rosacea. It is also used to treat inflammatory bowel diseases, skin allergies and infection on animals which is caused by Bacteriodes and Clostridium species.</p>
8.	2019	<p>Sarcoid cream</p> 	<p>Sarcoid gel is topical chemotherapy treatment with the active ingredient being 5-fluorouracil and zinc oxide. The use of intratumoural 5-fluorouracil compares favourably with other treatment modalities for sarcoids, with a long term successful resolution rate in horses. The present gel is formulated for the smaller sarcoid equivalent to ≤ 2cm.</p>
9.	2019	<p>AMS beads</p> 	<p>This formulation contained enteric coated cellulose which retains the gastrointestinal microbiome and improves the immunity against the infections in chickens. The developed formulation with the applicability on chickens produced significantly reduced fecal oocysts compared to E. maxima-infected group fed standard diet.</p>
10.	2019	<p>Probeads-EC</p> 	<p>Unique polymer based enteric coated probiotic beads. Targeted delivery of probiotic supplement for poultry birds so as to maintain gut health in chicken by competitive exclusion of pathogens.</p>
11.	2019	<p>AMS green tea</p> 	<p>This aluminum magnesium silicate is used as an antacid and this formulation have been shown to significantly inhibit the sporulation process of coccidian oocysts while the selenium and polyphenolic compounds in green tea are thought to be active compounds to inactivate the enzymes responsible for coccidian sporulation while protecting the intestinal architecture.</p>
12.	2019	<p>CPV2b Vaccine</p> 	<p>Low passage High titer vaccine developed for Canine Parvo enteritis in dogs. The virus was adapted in A72 cells and sub cultured for 66 passages. The virus was up scaled at 45th passage, freeze dried and characterized. The safety studies in dogs are under progress at M/s Palamur biosciences.</p>
13.	2019	<p><i>Theileria annulata</i> Vaccine</p> 	<p>Cell culture based Live attenuated <i>Theileria annulata</i> schizont infected lymphocyte vaccine for tropical bovine theileriosis is being developed at TRPV. Five different <i>T. annulata</i> isolates are being continuously passaged more than 160 times and verified for virulence. <i>In vitro</i> studies confirmed that three <i>T. annulata</i> isolates are showing the signs of attenuation.</p>