Animal Reproduction Biotechnology Solutions - IMV Technologies

S. Sharma

IMV India Pvt. Ltd., Plot no. 750, Phase-V, Udyog Vihar, Gurugram, India
Corresponding Author: contact@imvindia.com

Introduction

Animal reproduction is a cornerstone of the livestock and veterinary industries, impacting food security, animal welfare, and breeding programs globally. Biotechnology solutions have increasingly become essential tools for improving reproductive efficiency, health management, and genetic progress. IMV Technologies, a French company founded in 1963, has been at the forefront of innovation in animal reproduction biotechnology. The company provides cutting-edge solutions that address various stages of the reproductive process in multiple animal species, including cattle, swine, equine, poultry, and companion animals.

This manuscript explores the key biotechnology solutions offered by IMV Technologies, their applications in animal reproduction, and their impact on the global livestock industry.

Overview of IMV technologies

IMV Technologies is headquartered in L'Aigle, Normandy, France, and operates in more than 120 countries. The company specializes in biotechnological products and services related to artificial insemination (AI), embryo transfer, semen analysis and preservation, and veterinary imaging. With over 60 years of experience, IMV Technologies has developed an extensive portfolio of products that have revolutionized reproductive practices in veterinary and livestock industries.

Our guiding motto– IMV technologies for life

"For Life" reflects a multifaceted mission to advance reproductive biotechnologies that support animal breeding, biodiversity preservation, and sustainable agriculture. Our core objectives include developing innovative tools for artificial insemination, embryo transfer, and veterinary imaging, while also promoting ethical practices and environmental stewardship.

We strive to improve reproductive efficiency across species, ensure food security through sustainable livestock production, and contribute to the conservation of endangered animals. IMV's work is driven by a commitment to scientific innovation, global collaboration, and long-term impact on both animal and human life. We are dedicated to ongoing innovation through a customer-focused approach, collaborating closely with industry pioneers to empower our clients in enhancing the productivity and quality of their work.

In the upcoming section we will discuss regarding the solutions provided by IMV Technologies:

IMV bovine reproduction technologies

Preliminary diagnosis

a. Imaging: IMV Imaging is the dedicated veterinary imaging division within the IMV Technologies group, specializing in ultrasound-based diagnostic solutions tailored for all species.

IMV Imaging combines robust hardware, wireless capabilities, versatile probes, and cloud-connected apps to deliver high-quality diagnostic imaging. Our full ExaPad range is designed with the mixed practice vet in mind suitable for both routine work and advanced applications.

Our revolutionary new technology takes fertility scanning to the next level to improve dairy herd performance.

As you scan, it will automatically:

- Identify the ovary, Corpus Luteum and follicle on an ultrasound image
- Highlight and label them in colour on your tablet or BUG:Go screen
- Take and display precise measurements – to the nearest mm
- All without interrupting your workflow, in fact, it could speed up the scanning process by up to 3 times
- Exclusive to the Easi-Scan:Go

b. Protection: IMV Technologies offers a comprehensive protection range, which specializes in protective gear for veterinary surgeons, inseminators, and farmers. This includes Veterinary gloves in various sizes and materials, calving gowns and overboots.

Semen collection and analysis

One of the primary contributions of IMV Technologies is in the development of systems for semen collection and processing. Semen collection systems emphasize safety, hygiene, and optimal sperm viability. Semen processing equipment the latest innovation, αlpha digitcool.

IMV Technologies offers advanced semen processing solutions, including:

1. **eSmile**: A user-friendly laboratory management software which links all aspects of semen traceability and semen processing.
2. **Artificial Vagina**: This vagina is designed to ensure the comfort of both the bull and the operator during semen collection with **Liner, cone & collection tubes.**
3. **EasyCyte Flow Cytometer**: For assessing sperm viability, acrosome integrity, and membrane functionality.
4. **IVOS II Computer-Assisted Semen Analyzer (CASA)**: Quantifies motility, concentration, morphology and DNA fragmentation. The CASA systems use high-resolution imaging and algorithms to detect movement patterns of spermatozoa. These are cross-referenced with concentration and morphology data to provide a

comprehensive fertility index. This allows for data-driven breeding decisions in AI centers and research labs.

5. **Leja slides**: The most accurate fixed-depth slides on the market. Leja calibrated slides provide the accuracy and precision needed to reliably analyze semen. Leja slides facilitate analyses standardization.

Semen preparation and packaging

IMV Technologies offers a wide range of bovine media products designed to support every stage of artificial insemination and embryo transfer.

- **OptiXcell**: Unique liposome-based extender without animal protein, for fresh and frozen bovine semen.
  We have developed OptiXcell: the first semen extender based on - synthesized liposomes (without animal protein). Liposomes are IMV Technologies solution to replace egg yolk. OptiXcell allows a safe and high- quality preparation and preservation of both your fresh and frozen semen doses.

Other media range includes BullXcell, Optidyl etc.

- **IRIS Printer**: IRIS Compact offers a wide range of printing options, allowing you to print straws and rods with unique field type, barcode, and logos. With IRIS, all laboratories can have access to traceability with a low cost of ownership.

- **ISevo**: Designed for laboratories which look for efficiency and simplicity, ISevo is the new generation straw filling equipment. Key benefits will include Semen saving, Time saving, Smart ergonomics, Easy to clean,

Unique traceability and Peace of mind.

- **Straws**: IMV Technologies offers a diverse range of semen storage straws designed for artificial insemination, particularly in bovine reproduction. The main straw types include Classic straw, TBS straw, Sensitemp straw and Ipha straw. The α**lpha straw** is IMV Technologies latest technology in bovine semen straws. It ensures correct filling of the straw, enhancing the safety of the dose. Once the straw plug reaches the appropriate level of moisture, the straw plug will fluoresce to indicate that a quality seal has been achieved. The Ipha straw helps to prevent potential losses during thawing. Its colored plug turns fluorescent when correctly moistened, enabling automatic and / or visual control of the plug's moisture level.

- **Digitcool** α**lpha:** Controlled rate Straw freezer designed for a precise and uniform semen straw freezing. The Digitcool αlpha human-centered features ease daily operations in laboratories.

Insemination and reproduction follow up

IMV Technologies offers a comprehensive suite of tools and protocols for insemination and reproduction follow-up, designed to enhance fertility outcomes and streamline reproductive management in livestock:

- **AI Gun**: Kombicolor is a durable stainless steel bovine semen applicator, which can be used with both mini and medium straws. The added ridge eliminates the need for O-rings and ensures a tight connection with unsplit sheaths. Other range like **TBS Application, Flexia** are

- **αlphaVision**: It is more than a bovine insemination gun. This tool is designed to provide general assistance in reproduction in addition to aiding insemination. This insemination gun is equipped with a camera, that allows the operator to identify the best time to inseminate.
- **αlpha Sheath**: With its specific dome head, the lpha sheath passes smoothly into the cervix and through the cervical folds. Its dual-lateral delivery improves hygiene.
- **Veterinary imaging**: IMV Imaging is the dedicated veterinary imaging division within the IMV Technologies group, specializing in ultrasound-based diagnostic solutions tailored for all species. **Easi Scan: Go range** provides complete solution for follow up.

Embryo transfer and cryopreservation

Embryo transfer technology is crucial for genetic dissemination and increasing reproductive efficiency. IMV Technologies offers complete systems for embryo collection, evaluation, and transfer. These solutions are particularly vital in cattle and equine industries, where embryo transfer allows breeders to leverage superior genetics from elite females.

Biotechnology in bovine reproduction

IMV Technologies plays a leading role in advancing biotechnology for bovine reproduction through a comprehensive array of tools and methods that support each stage of the reproductive cycle. From the collection and detailed analysis of semen using high-precision systems to the preparation and preservation of samples with advanced storage techniques, their solutions are designed to ensure efficiency and traceability. Our artificial insemination methods are built to maximize accuracy and increase conception success rates. The company also contributes to genetic improvement through embryo transfer technologies that facilitate the collection, freezing, and implantation of embryos, enabling selective breeding and broader distribution of valuable genetics. In terms of reproductive monitoring, they offer advanced imaging systems that help detect pregnancies early and assess reproductive health effectively. These innovations are all integrated with digital tracking platforms that provide crucial data for optimizing herd fertility and productivity. Operating across more than 120 countries and involved in breeding millions of cattle annually, IMV Technologies is at the forefront of shaping the global future of cattle reproduction.

Biotechnology in swine reproduction

IMV Technologies enhances swine reproduction through a suite of biotechnological tools that span the entire reproductive process. IMV Technologies offers tailored solutions:

1. Semen Collection & Analysis:

- Collectis® system enables hygienic and efficient semen collection.

2. Semen Packaging & Storage:

- Automatic filling, sealing and labelling machine for GTB bags and BactiBags.

3. Artificial Insemination Tools:

- GoldenPig®, GoldenGilt®, and DeepGoldenPig® catheters provide tailored options for different sow types and insemination depths.

4. Reproductive Follow up:

- Duo Scan Go ultrasound scanner allows for pregnancy detection and reproductive health assessments.

Training and technical support

IMV Technologies emphasizes not just product delivery but also capacity building through:

- **Workshops and Seminars**
- **Technical Support Teams**

In countries like India, IMV collaborates with veterinary colleges and cooperatives to offer practical AI and embryo transfer training, ensuring wide-scale adoption of biotechnology.

Environmental and ethical considerations

IMV Technologies places a strong emphasis on environmental sustainability and ethical responsibility across its operations. Our philosophy, captured in the phrase "Sustainability. For life," reflects a commitment to minimizing environmental impact while promoting biodiversity and animal welfare.

Environmentally, IMV integrates renewable resources into its manufacturing processes and actively explores biodegradable, compostable, and recyclable materials for its products. We have also eliminated the use of certain inputs that could pose risks to the environment, animal health, or public safety. Our efforts extend to reducing their carbon footprint and promoting sustainable agriculture by helping optimize land use through their technologies.

Ethically, IMV is deeply involved in preserving genetic diversity and protecting endangered species. Our collaborate with conservation experts to support the reproduction of threatened animals—from rhinoceroses to large cats—using their reproductive technologies. The company also upholds a strong code of ethics that guides its research, development, and global operations.

Global impact and future prospects

IMV Technologies has played a transformative role in the global livestock sector by enabling better control over reproduction. Our products are used by:

- National breeding programs.
- Large-scale commercial farms.
- Veterinary hospitals and universities.
- NGOs working in animal conservation.

With ongoing investments in R&D, IMV is exploring new frontiers in reproductive genomics, artificial intelligence for semen evaluation, and precision livestock farming.

Conclusion

Animal reproduction biotechnology is vital to enhancing productivity, sustainability, and genetic advancement in livestock. IMV Technologies has been a pioneer in this field, offering a comprehensive suite of tools that have reshaped how reproduction is managed in various species. From semen collection, embryo transfer to pregnancy diagnosis and back fat measurement with the imaging solutions, from swine AI to equine transport, IMV's solutions continue to set global standards. With a commitment to innovation, education, and ethical practices, IMV Technologies remains a cornerstone of modern animal reproductive biotechnology.