



## **DR Henry William Vivanco- Mackie, Summary of Achievements**

Pioneering work in the development of many of the currently available reproductive technologies in farm animals: Ram semen freezing, intrauterine AI in sheep and goats, cervical AI in sheep with frozen semen, stallion semen freezing and horse AI, alpacas semen collection dilution and AI, pigs semen collection, preservation and AI, sheep super-ovulatory regimes, sheep and goats laparoscopic embryo flushing and transfer, sheep embryo bisection, cattle semen freezing and AI, cattle semen preservation at room temperature, cattle ovum pick up and in vitro embryo production and transfer, freezing cattle in vitro embryos for direct transfer, sheep and cattle oestrus synchronization systems, alpacas super-ovulation regimes, cattle and sheep sperm sexing by flow-cytometry, embryo sexing, embryo cloning, cloning of adult individuals.(see list of publications).

- Produced the first lambs born in the world (1979) from laparoscopic intrauterine insemination of frozen semen in sheep opening the way for international interchange of ram semen.
- Rescued from extinction to "LADY" the "Enderby Island Cow" (rare breed from the Auckland Islands of New Zealand ) by producing a bull calf by IVF ( Derby ) and a clone of Lady: "ELSIE" (LC) by somatic cell nuclear transfer procedures. "Elsie" was produced in a joint project with Dr David Wells of AgResearch Reproductive Technologies Group and was the first cattle clone born alive in the world.
- Produced the first calf born in the southern hemisphere from sperm sexing.
- Produced the first calves born in the world from cloning of in vitro produced embryos by nuclear transfer of blastomeres
- Directed from 1988 to 1992 the largest sheep embryo transfer operation in the world producing 30,000 lambs from 300 donors at LambXL , New Zealand .
- Directed during 1993 and 1994 the most intense sheep embryo transfer operation in the world, producing 10,000 lambs in 18 months from 300 donors at The Australian Texel Corporation, Australia .
- Developed and applied in commercial scale (more than 4,000 embryo bisections per year) the embryo bisection technology producing thousands of identical twin lambs for LambXL , New Zealand .
- **Developed and applied at commercial level the ovum pick up and in vitro embryo production technology in cattle and sheep, installing 4 commercial and R&D laboratories around the world ( ArTech laboratory at AgResearch-Ruakura; South Pacific Biotech laboratory in Echuca, Australia; CIETE laboratory at the National Agrarian University of Lima Peru; BTA laboratory in Puerto Varas Chile).**
- **Developed embryo freezing techniques for in vitro produced embryos for direct transfers, making feasible the international sales and transfers of IVP embryos. Produced more than 40,000 frozen in vitro embryos (arTech plus SPB) with live calves born from these embryos in New Zealand , Nepal , Falkland Islands , China and Australia .**
- Trained farmers, technicians, students, post graduates, veterinarians and other professionals in animal reproduction technologies and genetic improvement in many countries: Peru , Ecuador , Chile , Mexico , Bulgaria , Finland , ex-Soviet



Union (Siberia), Saudi Arabia , China , Singapore , Italy , USA , New Zealand , Australia , Falkland Islands .

- Consulted in many countries as private consultant, as FAO contracted consultant, as IICA (Inter American Institute of Cooperation for Agriculture) contracted consultant, in the areas of animal genetic Improvement, animal reproduction, optimization of systems of animal production and application of cutting edge animal biotechnologies.
- Developed a Genetic Evaluation and Selection System ("GENESYS") for Sheep meat producing breeds and Beef Cattle and applied it commercially in New Zealand and Australia .
- Achieved status of Principal Professor at the National Agrarian University of Lima Peru teaching Animal Reproduction and Genetic Improvement and directing several Research Programs at national level and with international cooperation. Worked at the University from 1972 up until migrated to Australasia in 1988. Other academic posts: Professor at the University of Esmeraldas , Ecuador ; Professor at the Pontifical Catholic University of Lima Peru. Currently Visiting Professor at the Graduate School of the Department of Animal Production of the National Agrarian University of Lima Peru .

#### **Education:**

- PhD in Animal Science, Reproductive Physiology: Utah State University , Logan Utah , USA , 1988
- MSc in Agriculture, Reproductive Physiology and genetic improvement: California State Polytechnic University , Pomona , California , USA , 1983
- BSc in Animal Production 1970: National Agrarian University , Lima Peru .
- Engineer in Zootechnics (Animal Production) 1971: National Agrarian University , Lima Peru .
- Stages for short term training and/or scientific visits:
  - UK : Univ. Of Cambridge ; Univ. of London ; Roslyn Institute. Scholarship of British Council.
  - Holland : IVO Institute of Animal Science, ZEIST . Scholarship of the Gov. of the Netherlands .
  - USA : Univ. of Colorado ; Univ. of Cornell . Scholarship of FAO/IAEA
  - Australia: CSIRO Rockhampton, CSIRO Prospect, CSIRO Armidale. Scholarship of FAO/IAEA