360°

YOU PROVIDE THE GENETICS, WE PROVIDE FOLLTROPIN®
EMBRYO TRANSFER WITHIN YOUR REACH

FOLLTROPIN®

25 YEARS OF REPRODUCIBLE RESULTS

Folltropin® is a purified pituitary extract that has been used successfully in breeds of cattle globally for 25 years.
Folltropin® is one of the safest products for use in superstimulation protocols due to its low LH content, and it is the most cited commercial FSH product in embryo transfer literature.

vetoquinol
ACHIEVE MORE TOGETHER

Batch after batch, vial after vial, Folltropin® delivers reproducible results.

Folltropin® is used for the induction of superovulation in reproductively mature heifers and cows.

Folltropin® is one of the safest products for use in superstimulation protocols due to its low LH content, and it is the most cited commercial FSH product in embryo transfer literature.

Folltropin® is a highly purified extract obtained from carefully selected porcine pituitary glands, and has a consistently low LH:FSH ratio. It is lyophilized to maintain potency under normal storage conditions.

Each sterile 20 mL vial contains FSH equivalent to 400 mg (700 IU) of NIH-FSH-P1. When reconstituted according to label directions the final solution contains 20 mg/mL.

Folltropin® was developed specifically for the superstimulation of domestic animals used in embryo transfer, based on the limitations of other gonadotrophin preparations available in the market.

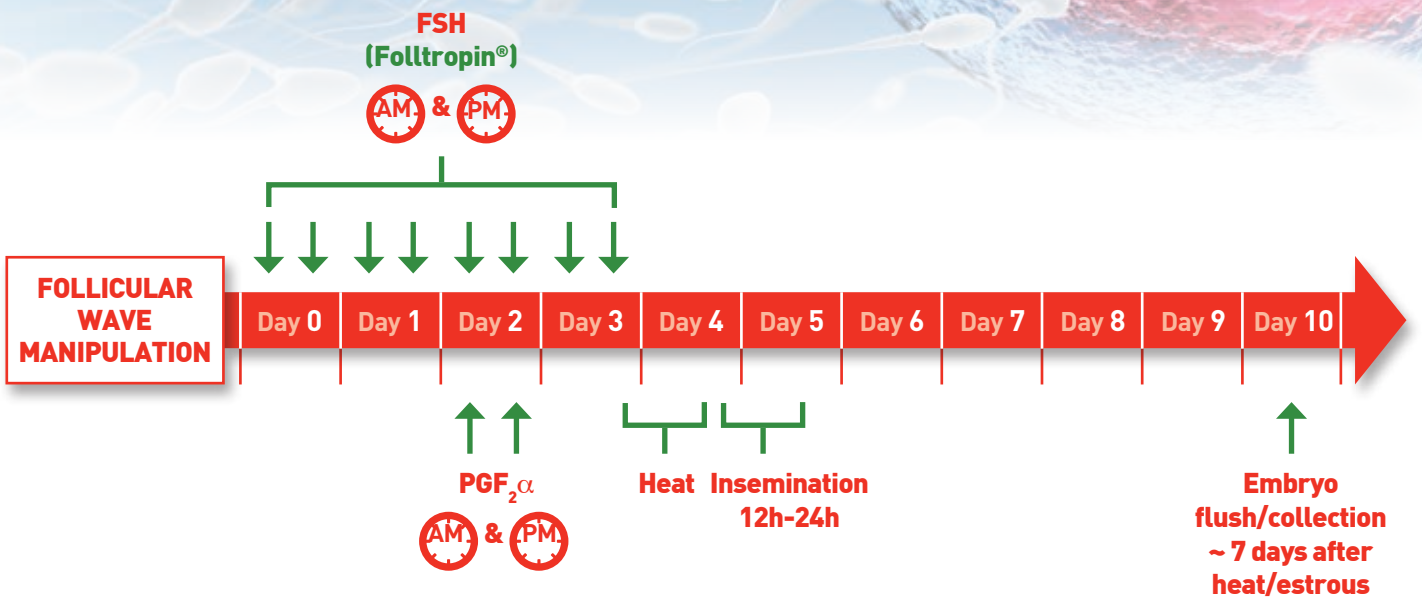
A great deal of effort has been expended over the years in improving superstimulaltion treatment protocols. Treatments have evolved from natural luteolysis to complete control of follicular development and ovulation. These advances have made superovulation treatment more "user friendly" and have helped in disseminating the application of embryo transfer technology throughout the world. A major advancement has been the purification of gonadotrophin products for the induction of superstimulation.

Folltropin® is a purified pituitary extract that has been used successfully in breeds of cattle globally for 25 years.

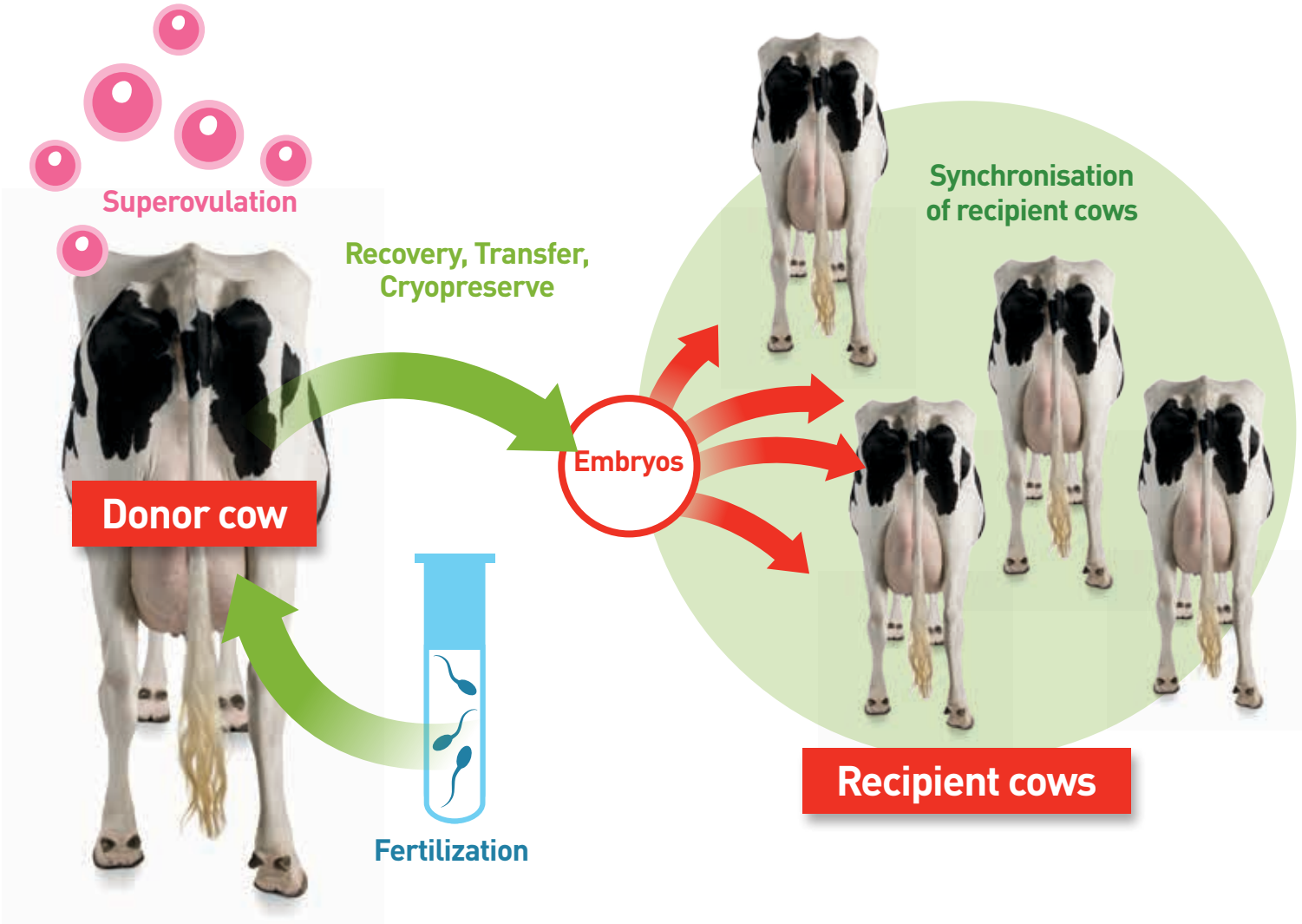
vetoquinol

was founded in Lure, France, at the beginning of the 1930's, from Joseph Frechin's vision. Since then, Vetoquinol has always remained a family owned business acknowledged for its sustained growth throughout the decades. Vetoquinol now is recognized as a worldwide leader in the animal health market.

SIMPLE PROTOCOL FOR SUCCESS



Superovulation scheme



PROVEN LOW LH RATIO DEMONSTRATES BENEFITS

Individual donor cow variability is an important factor affecting superovulatory response.

However → dose-response trials have demonstrated that gonadotrophin preparations with **high levels of LH present had detrimental effects on ova/embryo quality** at high doses **whereas more purified pituitary extracts did not.**

SUPEROVULATION IN THE COW; EFFECTS OF BIOLOGICAL ACTIVITY OF GONADOTROPHINS;
S.J. Alkemade, B.D. Murphy and R.J. Mapletoft

Data indicate that:

- Detrimental effects of high doses are due to overdosing with LH, and
- Purified pituitary extracts with LH removed had a much broader optimal dose range and increasing doses had no detrimental effect on ova/embryo quality.

Superovulatory response of *Bos Taurus* cows superstimulated with FSH (400 mg NIH-FSH-P1) and varying amounts of LH

Group	Ova/Embryos					
	n	CL	Total	Fertilized	(%)	Transferable
I (100% LH)	21	10.2[a]	7.3[a]	5.3[c]	(73)	4.0
II (32% LH)	20	11.1[a]	6.4[a]	4.6[c]	(72)	3.9
III (16% LH) - Folltropin®	20	15.6[b]	13.6[b]	9.7[d]	(71)	7.7
IV (Pure FSH)	20	17.2[b]	13.2[b]	8.3[d]	(63)	5.5

Means with different superscripts are different ([ab] – $P < 0.05$; [cd] – $P < 0.07$).

Mapletoft *et al.* Reprod. Nutr. Dev. 42 (2002) 1–11

Contributing to this discussion

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PhD. Guest Faculty Colorado State University. 30 years + Commercial ET experience. Technical Services Advisor Vetoquinol.

Reuben J. Mapletoft
Distinguished Professor Emeritus, Department of Large Animal Clinical Sciences Western College of Veterinary Medicine University of Saskatchewan.

Gabriel A. Bó
D.V.M., M.V.Sc., Ph.D. President of IRAC (Instituto de Reproducción Animal Córdoba, Argentina).

FOLLTROPIN® MOST CITED FSH PRODUCT GLOBALLY

Folltropin® is supported by a wide body of scientific literature spanning over 25 years with extensive publications from around the world.

1. Superovulatory response of Sistani cattle to three different doses of FSH during winter and summer. (2006)
2. Risk of transmission of *Mycobacterium avium* ssp. paratuberculosis by embryo transfer of *in vivo* and *in vitro* fertilized bovine embryos. (2006)
3. Alternative approaches to setting up donor cows for superstimulation. (2008)
4. Effect of progesterone administration on the ovarian response to superovulatory treatments in cattle. (2008)
5. Luteotrophic effect, growth and survival of whole versus half embryos and, their relationship with plasma progesterone concentration of recipient dairy heifers. (2008)
6. Serum biochemical parameters and embryo production during superovulatory treatment in dairy cattle. (2007)
7. Effect of estradiol valerate on ovarian follicle dynamics and superovulatory response in progestin-treated cattle. (2005)
8. The effect of strain of Holstein-Friesian cow on size of ovarian structures, periovulatory circulating steroid concentrations, and embryo quality following superovulation. (2008)
9. Detection of bovine viral diarrhea virus (BVDV) in single or small groups of preimplantation bovine embryos. (2007)
10. Bovine viral diarrhea virus (BVDV) associated with single *in vivo*-derived and *in vitro*-produced preimplantation bovine embryos following artificial exposure. (2009)
11. Intrauterine inoculation of seronegative heifers with bovine viral diarrhea virus concurrent with transfer of *in vivo* derived bovine embryos. (2010)
12. Differences between Brahman and Holstein cows in response to estrus synchronization, superovulation and resistance of embryo to heat shock. (2003)
13. Embryo production in superovulated Angus cows inseminated four times with sexed-sorted or conventional, frozen-thawed semen. (2010)
14. Immunization against inhibin enhances both embryo quantity and quality in Holstein heifers after superovulation and insemination with sex-sorted semen. (2009)
15. Improved superovulatory response in beef cattle following ovarian follicular ablation using a simple transvaginal device. (2007)
16. Superovulatory response in a bovine model of reproductive aging. (2008)
17. Bovine model of reproductive aging: Response to ovarian synchronization and superstimulation. (2006)
18. The effect of type of vaginal insert and dose of pLH on embryo production, following fixed-time. AI in a progestinbased superstimulatory protocol in Nelore cattle. (2007)
19. Improvement in recovery of embryos/ova using a shallow uterine horn flushing technique in superovulated Holstein heifers. (2003)
20. Diets enriched in unsaturated fatty acids enhance early embryonic development in lactating Holstein cows. (2007)
21. Different strains of noncytopathic bovine viral diarrhea virus (BVDV) vary in their affinity for *in vivo*-derived bovine embryos. (2004)
22. Infectivity of bovine viral diarrhea virus associated with *in vivo*-derived bovine embryos. (2004)
23. Polymorphisms in the 5' upstream region of the FSH receptor gene, and their association with superovulation traits in Chinese Holstein cows. (2010)
24. Closed pulled straw vitrification of *in vitro*-produced and *in vivo*-produced bovine embryos. (2010)
25. Gossypol disrupts embryo development in heifers. (2008)
26. Assisted reproductive technologies in cattle. (2007)
27. Superovulation in cattle: effect of FSH type and method of administration of follicular growth, ovulatory response and endocrine patterns. (1997)
28. Superovulation of beef heifers with Folltropin®: A new FSH preparation containing reduced LH activity. (1990)
29. The effect of commercially-available purified FSH and bovine anti-PMSG serum on the superovulation of dairy heifers. (1988)
30. Superovulation of beef cows with Folltropin®: a dose trial. (1988)
31. Superovulation of Holstein heifers under heat stress with FSH-P or Folltropin® in the cow. (1989)
32. Dose titration of Folltropin® in the cow. (1990)
33. Superovulation with three different commercial pituitary extracts in the cow. (1990)
34. The effect of dose schedule and route of administration on superovulatory response to Folltropin® in the cow. (1991)
35. Superovulation with a single subcutaneous injection of Folltropin® in the cow: Effect of dose and site of injection. (1992)
36. Alternative gonadotropins for superovulation in cattle. (1991)
37. A retrospective study to confirm the reproductive and embryological safety of Folltropin®-V use in dairy cattle. (2003)
38. Plasma follicle stimulating hormone (FSH) levels and superovulatory response in the cow after a single injection of Folltropin® dissolved in a polyvinylpyrrolidone solution. (1992)
39. Reproductive Safety Report: Effects of multiple superovulations with a porcine pituitary follitropin extract (Folltropin®-V) on future reproductive function in cows. (1989)
40. The effect of dose schedule and route of administration on superovulatory response to Folltropin® in Holstein cows. (1994)
41. Effect of exogenous progesterone on the superovulatory response in heifers inseminated with fresh or frozen semen. (1994)
42. A comparison of duration of Folltropin®-V administration in the cow to optimize the superovulatory response. (1992)
43. Efficacy study in cattle to determine the superovulatory response to a porcine pituitary follitropin extract (Folltropin®-V) under field conditions; United Kingdom. (1999)
44. Factors influencing the variability in superovulation results in German Holstein cattle. (1997)
45. Safety and efficacy of Folltropin®-V for the induction of superovulation in cattle. (1999)
46. Superovulation with Vetrepharm FSH (Folltropin®): Dose-response trial – dosage regimen. (1994)
47. Superovulation (SPO) with Folltropin® in beef heifers. Trial IV. (1987)
48. Superovulation of Canchin cows with Folltropin®. (1989)
49. Superovulation in the cow: The effect of reduced LH activity in gonadotrophin preparations. (1989)
50. A note on fertilization and embryo production in superovulated cattle with various levels of subcutaneous fat tissue. (1990)
51. Superovulation in the cow with a single subcutaneous injection of Folltropin®. (1991)
52. Effect of superstimulatory treatments on the expression of genes related to ovulatory capacity, oocyte competence and embryo development in cattle. (2013)
53. Effect of synchronization of follicle-wave emergence with estradiol and progesterone and super-stimulation with follicle-stimulating hormone on milk estrogen concentrations in dairy cattle. (2013)
54. Effect of duration of the growing phase of ovulatory follicles on oocyte competence in superstimulated cattle. (2013)
55. Differential gene expression of granulosa cells after ovarian superstimulation in beef cattle. (2013)
56. Endometrial response of beef heifers on day 7 following insemination on supraphysiological concentrations of progesterone associated with superovulation. (2012)
57. Lengthening the superstimulatory treatment protocol increases ovarian response and number of transferable embryos in beef cows. (2012)
58. Effects of diet type on establishment of pregnancy and embryo development in beef heifers. (2012)
59. Ovulatory follicle dysfunction in lactating dairy cows after treatment with Folltropin®-V at the onset of luteolysis. (2013)
60. Follicular characteristics and luteal development after follicle-stimulating hormone induced multiple ovulations in heifers. (2012)
61. Relationships between the ovarian status and superovulatory responses in dairy cattle. (2012)
62. Influence of factors during superovulation on embryo production in Korean Holstein cattle. (2012)
63. FSH withdrawal improves development competence of oocytes in the bovine model. (2012)
64. Effect of follicular aspiration just before ovulation on corpus luteum characteristics, circulating progesterone concentrations and uterine receptivity in single-ovulating and superstimulated heifers. (2012)
65. Superovulation of beef cattle with a split-single intramuscular administration of Folltropin®-V in two concentrations of hyaluron. (2012)
66. The Holstein cow in embryo transfer today as compared to 20 years ago. (2006)

FOLLTROPIN®

25 YEARS OF REPRODUCIBLE RESULTS

FOLLTROPIN®

400mg Powder an Solvent For Solution for Injection

ACTIVE CONSTITUENT: Follicle stimulating hormone. 400mg* (equivalent to 20mg*/mL when reconstituted according to directions).

DESCRIPTION: Folltropin®-V is a highly purified follitropin extract obtained from carefully selected porcine pituitary glands. It is lyophilized to maintain potency under normal storage conditions. Folltropin®-V Diluent is a 20mL vial of Bacteriostatic Sodium Chloride Injection USP.

STATEMENT OF CLAIM: For use in breeding-age heifers or cows to induce superovulation. Prior to the collection of superovulated and fertilized ova from these animals, estrus will have to be induced with prostaglandin F2α or a prostaglandin F2α analogue.

DIRECTIONS FOR USE: Not for administration to pigs. For intramuscular use. Reconstitute Folltropin®-V with Folltropin®-V Diluent.

DOSAGE AND ADMINISTRATION: Store reconstituted Folltropin®-V at between 2°C and 8°C (Refrigerate. Do not freeze). Use the contents within 5 days of reconstitution. Discard the unused portion. Start injecting animals on day 8-10 after observed or induced heat. Regimen: 2.5mL (50mg*) intramuscularly, twice daily, for 4 days. Administer prostaglandin F2α or a prostaglandin F2α analogue in order to induce heat for breeding. Dispose of empty container by wrapping with paper and putting in garbage.

WITHHOLDING PERIOD: 0 Days

TRADE ADVICE: EXPORT SLAUGHTER INTERVAL (ESI): This product does not have an ESI established. For advice on the ESI, contact Vetoquinol Australia Pty Ltd on 1800 032 355.

FIRST AID: If poisoning occurs, contact a doctor or Poisons Information Centre. Phone Australia 131126.

STORAGE & DISPOSAL: Store Folltropin®-V and Folltropin®-V Diluent below 25°C (Air Conditioning). Protect from light. For storage of reconstituted product see Dosage and Administration. Dispose of empty container by wrapping with paper and putting in garbage.

POTENCY & PURITY: It has been demonstrated that the ratio of follicle stimulating hormone (FSH) to luteinizing hormone (LH) present in pituitary extracts affects the ability of the ovary to respond to exogenous gonadotrophin treatment [1, 2, 3] Mean ovulation rates have been shown to decrease when the LH:FSH ratio increases.

[1] Previous FSH preparations have been shown to contain large amounts of LH, and to vary greatly in the LH:FSH ratio.[1, 3, 4, 5] The purification and quality control procedures used in preparing Folltropin®-V ensure consistently low LH:FSH ratios.[3, 6]

PACKAGING: 400mg* NIH-FSH-P1 with 20mL vial of diluent.

*National Institutes of Health (U.S.A.) reference standard NIHFSH-P1.

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2. Chupin, D., Y. Combarnos and R. Procurer (1985). Different effect of LH on FSH-induced superovulation in two breeds of cattle. Theriogenology 23:184.
3. Armstrong, D.T. and M.A. Opavsky (1986). Biological characterization of a pituitary FSH preparation with reduced LH activity. Theriogenology 25:135.
4. Lindsell, C.E., K. Rajkumar, A.W. Manning, S.K. Emery, R.J. Mapletoft and B.D. Murphy (1986). Variability in FSH:LH ratios among batches of commercially available gonadotropins. Theriogenology 25:167.
5. Murphy, B.D., R.J. Mapletoft, J. Manns and W.D. Humphrey (1984). Variability in gonadotropinpreparations as a factor in the superovulatory response. Theriogenology 21:117-125.
6. Vetoquinol N-A Inc. (1986-94). Data on file.

APVMA Approval No. 38750/54224

Folltropin® the global leader in superovulation

Folltropin® has been used successfully in breeds of cattle globally for 25 years

Folltropin® has helped in spreading the application of embryo transfer technology

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