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

- Detection of bovine viral diarrhea virus (BVDV) in single or superovulation. (2008)
- Immunization against inhibin enhances both embryo development in beef heifers. (2012)
- Superovulation of beef cattle with a split-single application of embryo transfer technology. (2011)
- Differences between Brahman and Holstein cows in embryological safety of Folltropin®-V use in dairy cattle. (2010)
- The Holstein cow in embryo transfer today as compared to exogenous gonadotrophin treatment. (1991)
- Factors influencing the variability in superovulation results among batches of commercially available gonadotropins. (1994)
- Efficacy study in cattle to determine the superovulatory response to a porcine pituitary follitropin extract (Folltropin®-V) under field conditions; United Kingdom. (1989)
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 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 superstimulation 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.

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

### SIMPLE PROTOCOL FOR SUCCESS

#### Superovalulation scheme

1. **FSH (Folltropin®)**
   - Day 0
   - Day 1
   - Day 2
   - Day 3
   - Day 4
   - Day 5
   - Day 6
   - Day 7
   - Day 8
   - Day 9
   - Day 10

2. **Heat Insemination**
   - 12h-24h

3. **Embryo flush/collection**
   - ~7 days after heat/estrus

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

<table>
<thead>
<tr>
<th>Group</th>
<th>Ova/Embryos</th>
<th>n</th>
<th>CL</th>
<th>Total</th>
<th>Fertilized (%)</th>
<th>Transferable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (100% LH)</td>
<td>0/ / . ,0 a 5,1 a 3,1 c (51)</td>
<td>2,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II (32% LH)</td>
<td>0. //, / a 4,2 a 2,4 c (50)</td>
<td>1,7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III (16% LH)</td>
<td>0. / 3,4 b</td>
<td>7,5 b (5 /)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV (Pure FSH)</td>
<td>0. / 5,0 b</td>
<td>1,0 b</td>
<td>6,1 b (41)</td>
<td>3,3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Means with different superscripts are different (P < 0.01). Mean values of means were compared.

### Contributing to this discussion

John Hasler, PhD, Senior Animal Reproductive Sciences Donovan, Inc., 256 Black Jack Rd, Blacklick, OH 43004, USA.

Ricardo J. Hergenreider, PhD, Diplomate in Reproductive Endocrinology, Colegio de Profesionales Veterinarios de la República Argentina.

Gabriel A. Bó, DVM, MSc, PhD, Demele, Veterinaria, La Rioja, Argentina.


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嵴芽卵期的母牛体外受精（Folltropin®）

- 每批每管均能获得可重复的结果。

- 萨洛普的四号激素，用于诱导超数排卵。

- 在超数排卵中使用时，是所有产品中最为安全的一种，因为它含有低浓度的LH，并是目前在胚胎移植文献中引用次数最多的FSH产品。

- 萨洛普是一种高度纯化的提取物，来自精心挑选的猪垂体中，并具有低LH:FSH比值。它被真空干燥以保持在正常存储条件下的效力。

- 每个无菌20mL瓶中含有FSH等同于400mg的NIH-FSH-P1。当按标签说明重新配制后，最终溶液的浓度为20mg/mL。

- 萨洛普是专门为适用于体外受精的家养动物而开发的，基于现有其它促性腺激素制剂的限制。

- 多年来，大量的努力被用于改进超数排卵治疗方案。这些进步使超数排卵治疗更加“用户友好”，并帮助传播了胚胎移植技术在世界范围内的应用。一个主要的进展是促性腺激素产品的纯化，用于诱导超数排卵。

- 萨洛普是一种经过纯化的垂体提取物，在全球范围内的奶牛品种中已有25年的成功使用历史。

### 更多转移的胚胎

- 个体供体牛的变异性是影响超数排卵反应的重要因素。

**更多转移的胚胎**

- 在研究中，对具有不同超数排卵反应的牛进行了比较。

### 证明低LH比率显示优势

- 过高剂量的LH移植会导致对胚胎质量的不利影响，而更纯化的垂体提取物则不会。

- 数据表明，用高剂量的LH移植会导致对胚胎质量的不利影响，而更纯化的垂体提取物则不会。

### 献身于这一讨论

- 约翰·哈塞尔，博士，高级动物生殖科学
- 罗斯卡·赫根理德，博士，生殖内分泌学
- 加布里埃尔·博，兽医，圣米格尔·德·内里亚

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*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.*

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