TAKE PART IN PROFITABILITY!

- Lower meat production cost
- Safe vaccination equipment
- Robust reduction of testes size
- Better FCR
Boar Taint

Males pigs are castrated in order to limit or eliminate problematic aggressive behavior, uncontrolled mating and repugnant odors related to sexually mature males, which represents a significant food quality problem.

Boar taint, the unpleasant odour of pork from a small proportion (less than 10%) of entire male pigs, is the main reason that is preventing the production of entire male pigs. Surgical castration is painful to pigs and therefore the routine castration of male pigs is under discussion in some regions like Europe.

Boar taint is an offensive odour or taste that can be evident during cooking or eating of pork products derived from non castrated male pigs. Boar taint of pork originated from sexually mature male pigs is caused by two major compounds namely androstenone and skatole.

### ANDROSTENONE

Androstenone (Fig. 1) is a male sex steroid hormone derived from progesterone that reinforces masculine characteristics. It is produced in the testes. It acts as a pheromone, and influences also some metabolic pathways.

The smell is described as urine-like.

### SKATOLE

Skatole (Fig. 2) is a molecule belonging to the indole family. It is produced from tryptophan in the mammalian digestive tract especially in the colon by the bacterial degradation. Indole and skatole are passively transferred from the colon into the blood. They are transported to the liver via the portal vein.

The smell of skatole depends on its concentration. In low concentrations, it has a flowery smell and is found in several flowers and essential oils. In higher concentrations its smell is related to manure.

Both androsterone and skatole possess the tendency to accumulate in the adipose tissue, due to their high lipophilic properties.

### PHYSIOLOGY OF HORMONAL REGULATIONS

The central organs regulating the hormonal cascade are hypothalamus and pituitary gland. Hypothalamus is the source of gonadotropin releasing hormone (GnRH), known also as a luteinizing hormone releasing hormone (LHRH).

LHRH is a neuropeptide consisting of 10 amino acids and is highly conserved across all mammalian species. When secreted into the pituitary gland, it binds to a LHRH receptor and triggers the production of LH and FSH. LH in males stimulates the production of testosterone, while FSH stimulates spermatogenesis in the testes.

![Diagram](http://quizlet.com/20361133/exss276-endocrine-system-reproductive-hormones-flash-cards/)

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Boar Taint

CEVA VALORA™ is a LHRH-based Synthetic Peptide Vaccine for swine containing three synthetic peptides as the immunogen. As LHRH is an endogenous decapeptide produced naturally in the hypothalamus of the animals, it is recognized by the immune system as a “self” antigen. Stimulating the animal to produce antibodies against the LHRH molecule can be accomplished by attaching it to another molecule that is not a part of the animal’s body and that will be naturally recognized as “foreign”.

In Ceva Valora™, LHRH is covalently linked to a distinct helper T cell sequence, forming a proprietary drug substance. The T cell helper sequence is bonded to the N-terminus of the decapeptide to avoid gonadotropin hormonal activity and to elicit T helper cell responses, which then mediates the anti-LHRH antibody responses by B cells.

Consumer preferences have changed in recent years from fat carcasses to lean carcasses and production has also been more focused on high growth rate and efficiency of feed conversion, as well as environmentally friendly production. The vaccination against LHRH (luteinizing hormone releasing hormone) allows pigs to grow as entire males for most of the growing–finishing period thus improving the profitability of farmers because fatteners get the benefit from the naturally better feed conversion efficiency and improved carcass composition of entire males. This constitutes a unique opportunity for a better income for producers but with the guarantee to get rid of boar taint in the meat.
A rapid, strong and specific antibody response:
Being injected with these peptide molecules, the immune system produces anti-LHRH antibodies that binds to the natural LHRH decapeptide. This immune complex inhibits the binding of LHRH to its natural cellular receptors and thereby blocks the action of the hormonal cascade aiming a similar effect to surgical castration, but keeping the advantages (better feed conversion ratio and better meat quality) of entire male pigs.

The efficacy of CEVA VALORA™ (groups V) was compared with another immunocastration product (groups I) in three different vaccination regimens: first injection always at 8 weeks of age and the booster either at 4, or 6 or 8 weeks before slaughter. The main efficacy indicators were antibody response, serum testosterone level and testicle size. In all those indicators CEVA VALORA™ performed better.

CEVA VALORA™ induced higher antibody response which didn’t decrease so rapidly as after the other product. The difference between V and I groups was always statistically significant at any time point.

<table>
<thead>
<tr>
<th>Anti LHRH blood titres</th>
<th>Anti LHRH blood titres</th>
</tr>
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<tbody>
<tr>
<td>2 weeks after booster</td>
<td>at slaughter</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time of booster in weeks prior to slaughter</th>
<th>V</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
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Blood testosterone (nmol/L) at slaughter

<table>
<thead>
<tr>
<th>V4</th>
<th>V6</th>
<th>V8</th>
<th>I4</th>
<th>I6</th>
<th>I8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.28</td>
<td>0.12</td>
<td>0.16</td>
<td>7.74</td>
<td>0.25</td>
<td>1.16</td>
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<td>0.24</td>
<td>0.19</td>
<td>0.16</td>
<td>21.03</td>
<td>0.40</td>
<td>2.28</td>
</tr>
</tbody>
</table>

There were individuals in groups I4 and I8 exceeding the levels>7nmol/L
A visible reduction of sexual organs

The average testicle size in all groups vaccinated with CEVA VALORA™ and revaccinated 4 or 6 or 8 weeks prior to slaughter (V4, V6, V8) was smaller than in pigs vaccinated with the other vaccine (I4, I6, I8). The difference was statistically significant between groups V4/I4 and V6/I6.

Box-and-Whisker Plot of testicle length of pigs at slaughter

The study showed that CEVA VALORA™ synthetic peptide LHRH vaccine was 100% effective in inhibiting testis growth and secretion of testosterone in vaccinated pigs. Immunocastration effects were clear. The efficacy was measurably higher than the one of another licenced immunocastration product.

The trial has demonstrated the very good flexibility of the vaccination program. According to the market expectation in terms of meat quality (ratio lean tissue/fat), it is possible to adapt the interval between the second shot and slaughter.
SmartVac VALORA™:
A unique vaccination equipment developed by Ceva
• **3 level Safety system:**
  1. Hand sensor: to switch on the device.
  2. Head pig sensor: a pressure is necessary to initiate a vaccination cycle. The rest of the time the needle is always retracted and protected.
  3. Second hand activator: Need to be pressed to initiate the vaccination process.

• **Compliance:** Thanks to the vaccine sensor, each pig receives a full dose of the vaccine. Only when a vaccination full cycle is accomplished, pigs are marked and the counter records it as a well implemented action. A cleaning procedure is included to guarantee the hygiene of the vaccination session. A unique recording system allows the data collection of every single action of the SmartVac VALORA™ using Bluetooth technology. It is the way we use to track that all the male pigs of the batch have been well vaccinated.

• **Easy to handle vaccinator:** There is no trigger that usually induces pain and is tiring to the operator. The speed of injection is very fast and the battery is very easy to change and allows the vaccination of more than 1000 pigs when properly used. A laser pointer helps the operator to target the proper injection site, just behind the ear. The design of the head helps to inject subcutaneously CEVA VALORA™.
• Visible and homogenous small size of reproductive organs
• Unique safe and compliant vaccination equipment
• First shot from 3 weeks of age
• Flexible timing of the 2nd shot

**DOSAGE AND DIRECTIONS**

The dose is 1 mL injected subcutaneously in the neck behind the ear. Two doses of vaccine should be administered to entire male pigs. The first dose should be given from 3 weeks of age. The second dose should be given at 4 to 10 weeks before slaughter. Withholding period: None. Storage: Store at 2 to 8°C. Do not freeze. Protect from light. Package: 50 dose, 100 dose and 200 dose vials.

For more details, see the SPC applicable in your country

This document contains information on a veterinary biological product sold in several different countries and areas where it may be marketed under different trade names and pursuant to different regulatory approvals. Accordingly, Ceva gives no guarantee that the details presented are correct with respect to all locations. In addition, the safety and efficacy data and the withholding periods may be different depending on local regulations. Please consult your veterinarian for further information.