Experience a new type of immunity!

The **NEW COMBINED VACCINE** against neonatal diarrhoea in piglets and sudden death in sows
The antigen, dendritic cells and macrophages, presenting cells are responsible for capturing the antigen and presenting it to the rest of the immunological system.

Ginsenosides are molecules that attract and stimulate the production and maturation of mononuclear cells, dendritic cells, and macrophages.

Ginsenosides induce the capture of the antigen.

MHC class I, Immunohistocompatibility I complex

The guidelines on the development of new adjuvants play a crucial role in enhancing the non-specific immune response.

HIPRAMUNE®-G is the new adjuvant based on saponins extracted from plants.
A water-based adjuvant with ginsenosides increases production of antibodies in comparison with conventional water-based adjuvants\textsuperscript{10}.

Immunological studies conducted at the HIPRA R&D Department have demonstrated that HIPRAMUNE\textsuperscript{G}:

- Stimulates production of peripheral mononuclear cells (this cell population is key at the inoculation site of a vaccine for giving a proper immunological response).
- Stimulates the maturation of dendritic cells, thereby improving an animal’s antigen presentation process.

The combination of a water-based adjuvant (aluminium hydroxide) and ginsenosides modulates the cellular and humoral response, thereby inducing improved protection\textsuperscript{9}.

The combination of a water-based adjuvant (aluminium hydroxide) and ginsenosides modulates the cellular and humoral response, thereby inducing improved protection\textsuperscript{9}.

Adjuvant developed by HIPRA from GINSENG: GINSENGOSIDES
Greater vaccinal safety

Thanks to its new generation water-based adjuvant, HIPRAMUNE®:

- **Does not produce FEVER**
- **Does not have ADVERSE REACTIONS**
- **Does not cause LUMPS at the inoculation site**

The safest vaccine

An experimental study conducted with SUISENG® and the leading vaccines marketed for preventing neonatal diarrhoea assessed their SAFETY. The results demonstrated that SUISENG® was the safest vaccine in the test.

**Progress of rectal temperatures in each treatment group**

<table>
<thead>
<tr>
<th>Day</th>
<th>Vaccination</th>
<th>Revaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 0</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Day 0 + 2 h</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Day 0 + 4 h</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Day 0 + 6 h</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Day 1</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Day 2</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Day 3</td>
<td>39.00</td>
<td>39.00</td>
</tr>
</tbody>
</table>

**Percentage of animals that showed some general or local sign after administration of the treatments**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>General signs</th>
<th>Local signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccination</td>
<td>25.0</td>
<td>12.5</td>
</tr>
<tr>
<td>Revaccination</td>
<td>50.0</td>
<td>12.5</td>
</tr>
</tbody>
</table>

*There are significant differences compared to the SUISENG® group.*

Optimal vaccinal safety with a light and potent adjuvant:
SUISENG® improved protection against neonatal diarrhoea under experimental conditions*

*In comparison with another water-based combined vaccine against E. coli and Cl. perfringens

The potency of SUISENG® is demonstrated in a challenge trial with E. coli

Three groups of 1-day-old piglets were chosen that had properly ingested colostrum and they were challenged with a strain of enteropathogenic E. coli.

% of diarrhoea and mortality in the first week of life

<table>
<thead>
<tr>
<th>% Mortality</th>
<th>% Diarrhoea</th>
<th>Morbidity (% Diarrhoea and/or Mortality)</th>
</tr>
</thead>
<tbody>
<tr>
<td>37,5</td>
<td>14,7</td>
<td>3,4</td>
</tr>
<tr>
<td>32,4</td>
<td>10,3</td>
<td>13,8</td>
</tr>
</tbody>
</table>

Nonvaccinated control (5 ml/dose) - SUISENG® (2 ml/dose) - Commercial vaccine (5 ml/dose)

50% of diarrhoea and mortality in the first week of life

3,4 14,7 3,4

32,4 35,3 13,8

SUISENG® (2 ml/dose) Commercial vaccine (5 ml/dose) Non-vaccinated control

Hyperimmunization against E. coli

The findings demonstrate SUISENG®s capacity for hyperimmunisation of colostrum against neonatal colibacillosis.

Hyperimmunization against necrotic enteritis in piglets (Cl. perfringens type C)

Titres of neutralising antibodies of the type C Cl. perfringens β toxin higher than 5 IU/ml of colostrum significantly prevent the mortality caused by necrotic enteritis in litters of piglets3.

Better protection
The most complete vaccine: TRIPLE protection

**Suiseng** is the only vaccine that prevents neonatal diarrhoea in piglets caused by *E. coli* and *Cl. perfringens* type C and neutralises the α toxin of *Clostridium novyi* responsible for sudden death in sows.

**Sudden death of lactating sows caused by Clostridium novyi**

*Clostridium novyi* types A and B is a Gram-positive anaerobic bacterium. Acute infection caused by it is considered the most significant cause of mortality in breeder sows.11,12,13

**SUDDEN DEATH** of sows is a problem that mainly affects sows in the last trimester of gestation and LACTATING BREEDERS.12,13

*Cl. Novyi*’s pathogenesis is mediated by the lethal necrotising α TOXIN.

Systemic dissemination of the α TOXIN produces cardio, neuro, histo and hepatotoxic effects that result in ACUTE or HYPERACUTE DEATH.11

**TRIPLE protection:**

- Neonatal diarrhoea caused by *E. coli*
- Necrotic enteritis of piglets caused by *Cl. perfringens*
- Neutralization of the *Cl. Novyi* α toxin
Efficaciously induces serum neutralising antibodies against the α toxin

HIPRA’s R&D Department assessed the capacity to induce SERUM NEUTRALISING ANTIBODIES against the α TOXIN of Clostridium novyi in breeder sows vaccinated with SUISENG®.

1. They collected serum from sows vaccinated with SUISENG®, and sows inoculated with physiological serum were maintained as a CONTROL group at the time of farrowing (3 weeks after the 2nd vaccination).

2. These sera were mixed with the purified α TOXIN of Cl. novyi.

3. They were inoculated in mice to assess the mortality induced by the toxin.

4. The findings demonstrated the capacity of the sera of the sows vaccinated with SUISENG® to neutralise Cl. TOXIN.

SUISENG® PROTECTS BREEDER SOWS AND THEIR PIGLETS
A MORE COMPLETE, EFFICACIOUS AND SAFE VACCINE

- Light and potent
- Better protection against neonatal diarrhoea caused by *E. coli* and *Clostridium perfringens* type C
- Greater antigenic spectrum
- Neutralizes the *Clostridium novyi* α toxin responsible for SUDDEN DEATH in lactating sows
- Protection of breeder sows and their piglets
- Maximum safety

2. Estudio PE-06-09.

**SUISENG®**: COMPOSITION PER DOSE (2 ml): F4ab fimbrial adhesin of *E. coli* ≥ 65% ER60; F4ac fimbrial adhesin of *E. coli* ≥ 78% ER70; F5 fimbrial adhesin of *E. coli* ≥ 79% ER50; F6 fimbrial adhesin of *E. coli* ≥ 80% ER25; LT Enterotoxoid of *E. coli* ≥ 55% ER70; Toxoid *Clostridium perfringens*, type C ≥ 35% ER25. Toxoid *Clostridium novyi* ≥ 50% ER120 % ERx: Percentage of immunized rabbits with a X serological EIA response. Adjuvant based on Aluminium hydroxide and Ginseng extract. **INDICATIONS**: Swine: For the passive protection of neonatal piglets by means of the active immunisation of breeding sows and gilts to reduce mortality and clinical signs of neonatal enterotoxicosis and Respiratory Disease. For active immunisation of breeding sows and gilts to induce seroneutralizing antibodies against α toxin of *Clostridium novyi*. **ADMINISTRATION ROUTE**: Intramuscular, into the neck muscles.

**SUISENG®**: COMPOSITION PER DOSE (2 ml): F4ab fimbrial adhesin of *E. coli* ≥ 65% ER60; F4ac fimbrial adhesin of *E. coli* ≥ 78% ER70; F5 fimbrial adhesin of *E. coli* ≥ 79% ER50; F6 fimbrial adhesin of *E. coli* ≥ 80% ER25; LT Enterotoxoid of *E. coli* ≥ 55% ER70; Toxoid *Clostridium perfringens*, type C ≥ 35% ER25. Toxoid *Clostridium novyi* ≥ 50% ER120 % ERx: Percentage of immunized rabbits with a X serological EIA response. Adjuvant based on Aluminium hydroxide and Ginseng extract. **INDICATIONS**: Swine: For the passive protection of neonatal piglets by means of the active immunisation of breeding sows and gilts to reduce mortality and clinical signs of neonatal enterotoxicosis and Respiratory Disease. For active immunisation of breeding sows and gilts to induce seroneutralizing antibodies against α toxin of *Clostridium novyi*. **ADMINISTRATION ROUTE**: Intramuscular, into the neck muscles.

**SUISENG®**: COMPOSITION PER DOSE (2 ml): F4ab fimbrial adhesin of *E. coli* ≥ 65% ER60; F4ac fimbrial adhesin of *E. coli* ≥ 78% ER70; F5 fimbrial adhesin of *E. coli* ≥ 79% ER50; F6 fimbrial adhesin of *E. coli* ≥ 80% ER25; LT Enterotoxoid of *E. coli* ≥ 55% ER70; Toxoid *Clostridium perfringens*, type C ≥ 35% ER25. Toxoid *Clostridium novyi* ≥ 50% ER120 % ERx: Percentage of immunized rabbits with a X serological EIA response. Adjuvant based on Aluminium hydroxide and Ginseng extract. **INDICATIONS**: Swine: For the passive protection of neonatal piglets by means of the active immunisation of breeding sows and gilts to reduce mortality and clinical signs of neonatal enterotoxicosis and Respiratory Disease. For active immunisation of breeding sows and gilts to induce seroneutralizing antibodies against α toxin of *Clostridium novyi*. **ADMINISTRATION ROUTE**: Intramuscular, into the neck muscles.

**SUISENG®**: COMPOSITION PER DOSE (2 ml): F4ab fimbrial adhesin of *E. coli* ≥ 65% ER60; F4ac fimbrial adhesin of *E. coli* ≥ 78% ER70; F5 fimbrial adhesin of *E. coli* ≥ 79% ER50; F6 fimbrial adhesin of *E. coli* ≥ 80% ER25; LT Enterotoxoid of *E. coli* ≥ 55% ER70; Toxoid *Clostridium perfringens*, type C ≥ 35% ER25. Toxoid *Clostridium novyi* ≥ 50% ER120 % ERx: Percentage of immunized rabbits with a X serological EIA response. Adjuvant based on Aluminium hydroxide and Ginseng extract. **INDICATIONS**: Swine: For the passive protection of neonatal piglets by means of the active immunisation of breeding sows and gilts to reduce mortality and clinical signs of neonatal enterotoxicosis and Respiratory Disease. For active immunisation of breeding sows and gilts to induce seroneutralizing antibodies against α toxin of *Clostridium novyi*. **ADMINISTRATION ROUTE**: Intramuscular, into the neck muscles.

2. Estudio PE-06-09.