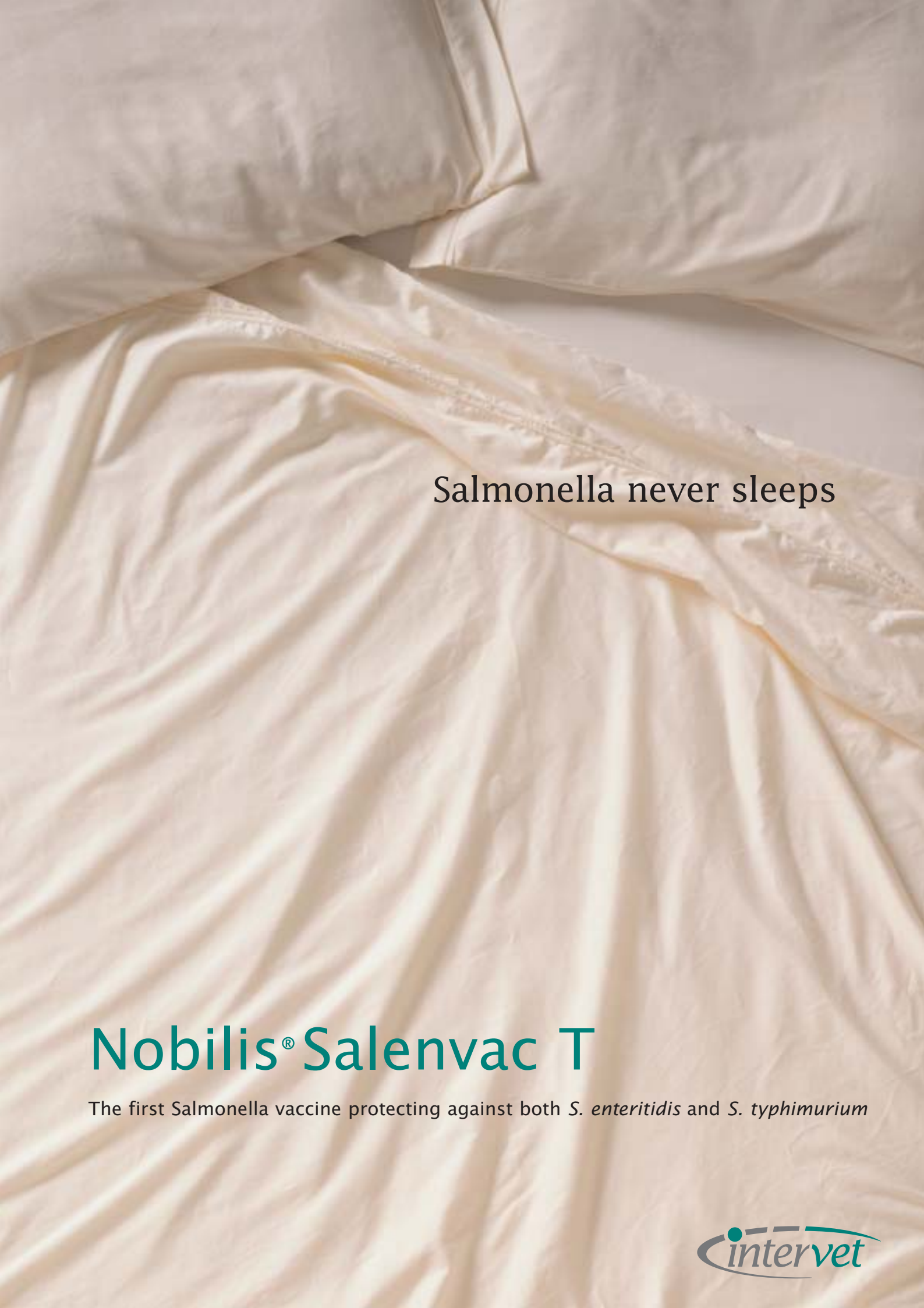


Salmonella never sleeps

Nobilis® Salenvac T

The first Salmonella vaccine protecting against both *S. enteritidis* and *S. typhimurium*

intervet

Making poultry safe is a 24-hour battle

Salmonellosis is the most frequently reported zoonotic disease in humans

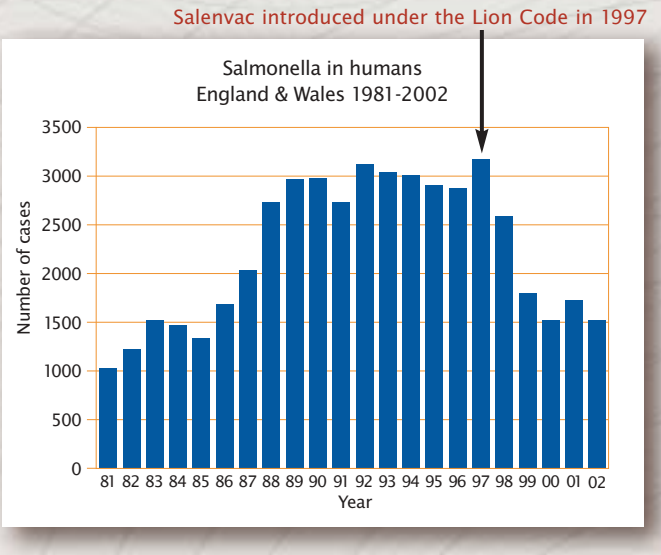
More than 150,000 cases of human Salmonellosis were officially reported from EU countries during the year 2000. Poultry meat and eggs are often singled out as a potential source of infection.

The EU has responded to this threat by forcing poultry producers to minimise Salmonella contamination of poultry (Zoonosis Directive EC/92/117).

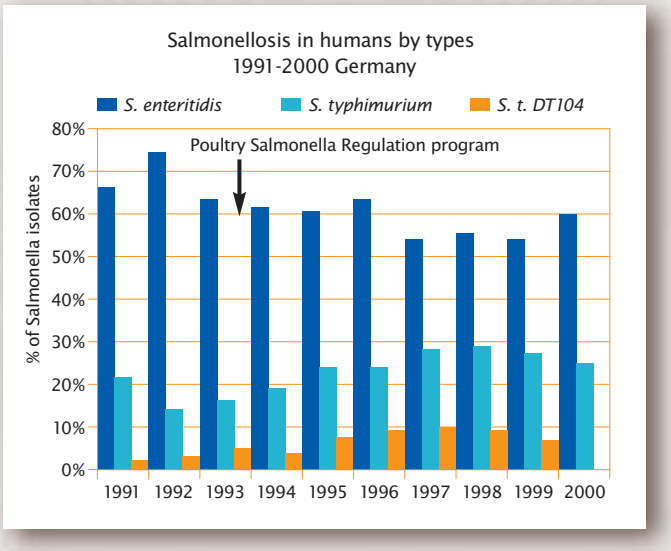
During the 1980s *Salmonella enteritidis* emerged world wide as the most common cause of human Salmonellosis. Hence, initial control measures in poultry were focused on *S. enteritidis*.

Salenvac is a proven tool in fighting Salmonella

Experiences in many countries prove that vaccination is an important tool in the control of Salmonella. In the UK a massive immunization campaign of breeders and layer hens contributed to a significant reduction in the contamination of chicken products and, ultimately, Salmonellosis cases in humans. Nobilis Salenvac, Intervet's *S. enteritidis* vaccine, was the first vaccine to be used in the UK Salmonella control program and is now successfully marketed internationally.



Salenvac, now with 'T', added protection against *S. typhimurium*



Despite success in reducing the incidence of *S. enteritidis*, *S. typhimurium* continues to cause concern to the poultry industry. It is frequently reported that during the control of *S. enteritidis*, a comparative increase in *S. typhimurium* is observed.

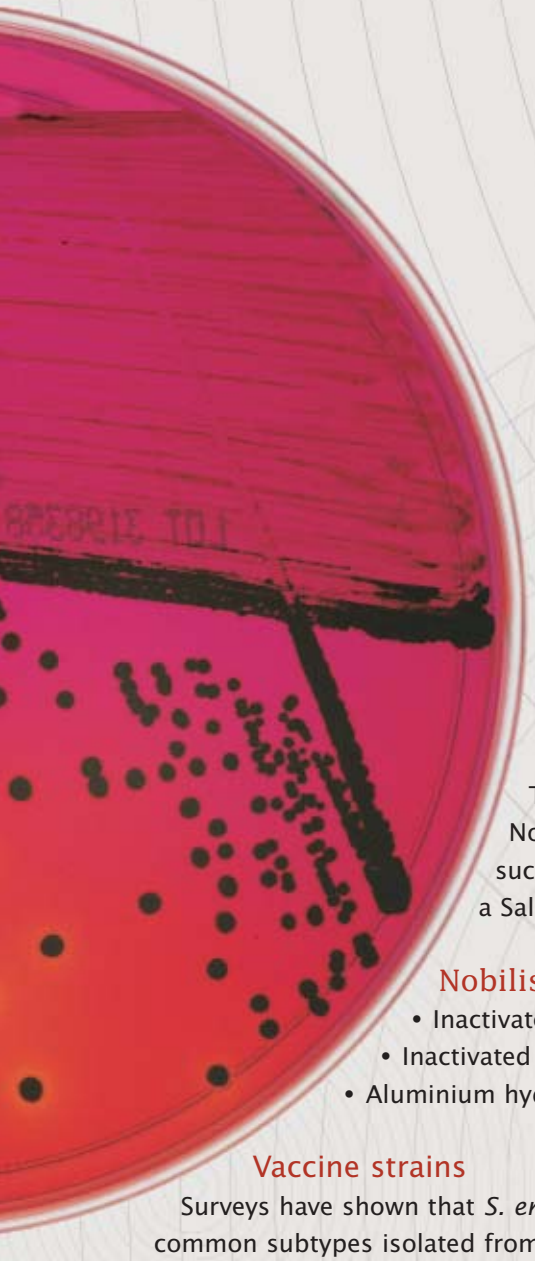
Similar to *S. enteritidis, S. typhimurium* causes illness in humans (gastric pains, nausea, vomiting, diarrhea, headache and dehydration). In chickens, *S. typhimurium* can cause clinical illness, but often infections are sub clinical with carrier birds contaminating the environment.

An additional concern associated with *S. typhimurium* is multiple antibiotic resistance. This is particularly true of *S. typhimurium* DT104, the most frequently isolated *S. typhimurium* subtype, which is resistant to at least five commonly used antibiotics.

Apart from antibiotic resistance making treatment difficult, resistance factors can also be passed on to other enteric bacteria with far-reaching consequences.

Nobilis® Salenvac T provides poultry producers with a vaccine against both *S. enteritidis* and *S. typhimurium.* This vaccine is a major step forward for poultry producers striving to achieve maximum food safety of poultry products.

Salenvac T's broad spectrum control protects against both *S.e.* and *S.t.* for safer poultry meat and eggs.



Nobilis® Salenvac T is the first vaccin

The first vaccine to protect against both *S. enteritidis* and *S. typhimurium*, Nobilis Salenvac T follows on the success of Nobilis Salenvac, that has been successfully used to vaccinate millions of breeding and laying hens as part of a Salmonella control program.

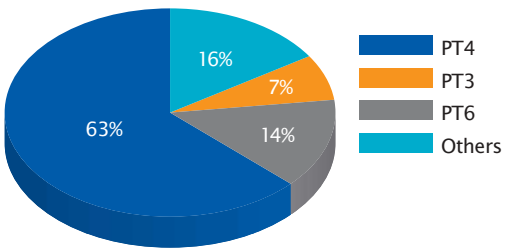
Nobilis® Salenvac T contains:

- Inactivated *S. enteritidis* PT (Phage Type) 4
- Inactivated *S. typhimurium* DT (Definitive Type) 104
- Aluminium hydroxide gel as adjuvant

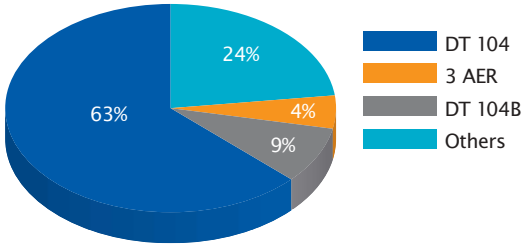
Vaccine strains

Surveys have shown that *S. enteritidis* PT4 and *S. typhimurium* DT104 are the most common subtypes isolated from cases of human Salmonellosis.

Incidents of *S. enteritidis* phage types in chickens in 1999



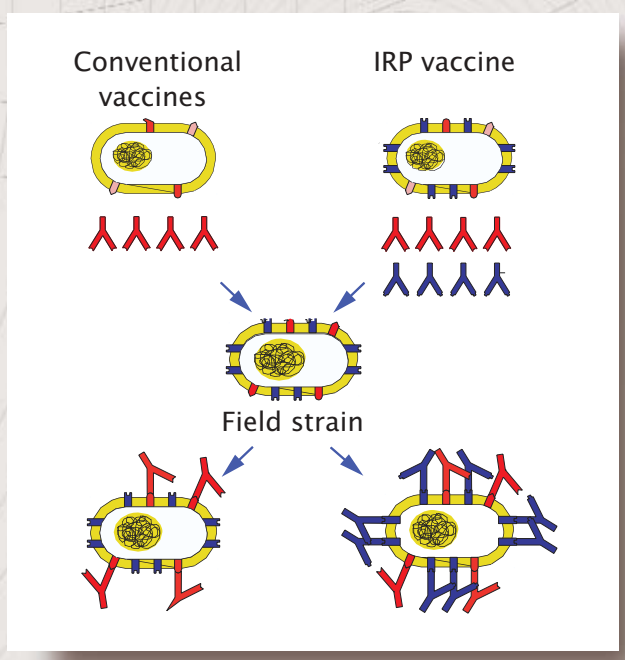
Incidents of *S. typhimurium* definitive types in chickens in 1999



e to fight two common enemies

Unique IRP technology provokes stronger response

Salmonella organisms need iron for their growth. In the environment of the chicken's intestine, iron is bound to proteins, decreasing its availability. To compensate, Salmonella form iron transfer mechanisms on their surface, so-called IRP's (Iron Regulated outer membrane Proteins). These enable an active resorption of iron from the intestine. IRP's are recognized as antigens to which antibodies are formed.



Nobilis® Salenvac T is produced under conditions of iron restriction, resulting in a proliferation of IRP's. This results in a vaccine that induces an immune response comparable with that infection, and hence a more adequate reaction against a Salmonella challenge.

TECHNOLOGY irp

Aluminium Hydroxide Gel Adjuvant

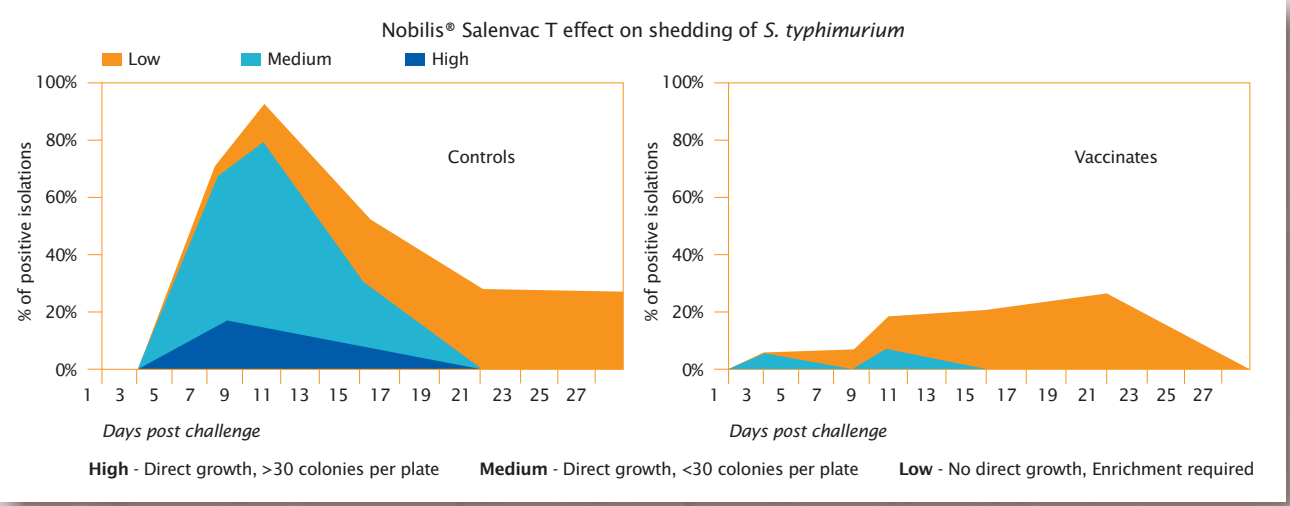
Nobilis® Salenvac T contains Aluminium Hydroxide Gel, an excellent adjuvant promoting a strong immune response and causing no adverse reactions at the injection site.

Potency tests have shown that the combination of *S. enteritidis* and *S. typhimurium* does not compromise the efficacy of either component. Salenvac T maintains the efficacy of Salenvac with the added benefit of *S. typhimurium* protection.

Nobilis® Salenvac T reduces shedding and egg contamination

Effect on shedding

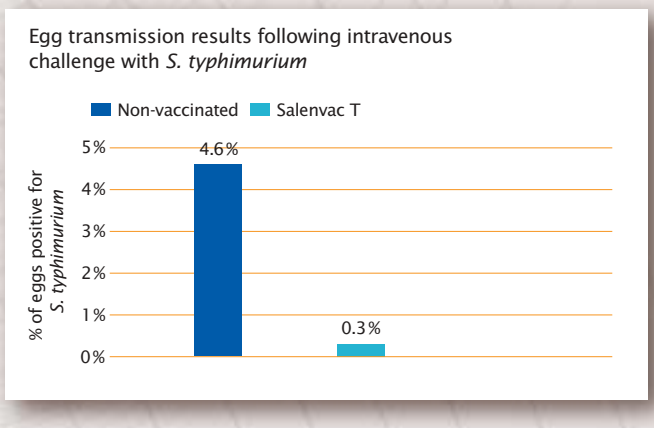
Shedding of wild-type *S. typhimurium* from the gastrointestinal tract of broiler breeders vaccinated with Nobilis® Salenvac T and non-vaccinated control birds was evaluated after exposure to "seeder" birds (birds known to be excreting high levels of *S. typhimurium*). The graphs below indicate the percentage of positive isolations from cloacal swabs.



Reduction of egg contamination

Egg transmission of *S. typhimurium* from commercial layers vaccinated with Nobilis® Salenvac T and non-vaccinated control birds following extremely heavy challenge by intravenous inoculation of *S. typhimurium* at 20 weeks of age.

Vaccination with Nobilis® Salenvac T significantly reduces the vertical transmission of *S. typhimurium* via the egg.



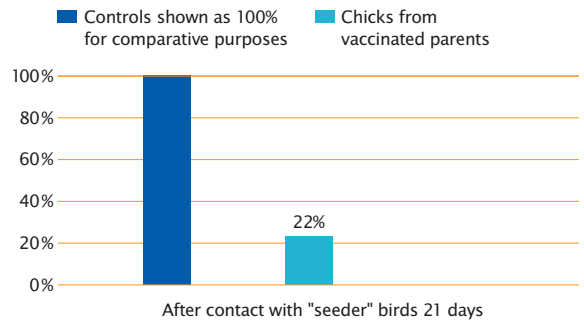
Trial results prove Nobilis® Salenvac T reduces *S. enteritidis* and *S. typhimurium* shedding.

Salenvac T helps to prevent horizontal transmission caused by shedding

The effect of maternally - derived antibodies

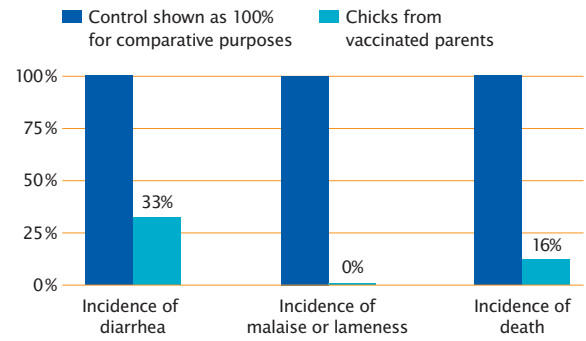
Day-old chicks from 57 week-old vaccinated parents or non-vaccinated parents, were placed in contact with “seeder” birds inoculated with *S. enteritidis.*

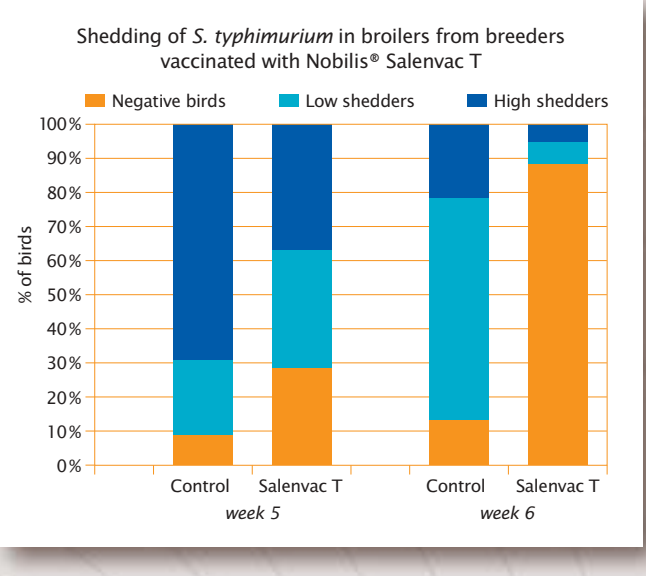
Total isolation of *S. enteritidis* from gall bladder, ovary, oviduct and caecum of chicks at post-mortem



These results clearly indicate that chickens of vaccinated breeders are less likely to become infected by *S. enteritidis* during the first 21 days of life.

Clinical signs in birds within 21 days of introduction of "seeder" birds





Negative birds: *no S.t isolation following direct or enriched culture*
Low shedders: *no S.t. isolation following direct culture, S.t. isolation following enriched culture*
High shedders: *S.t. isolation following direct culture.*

Less shedding of *S. typhimurium* in broilers

A comparison trial on shedding of *S. typhimurium* during 6 weeks of life in broilers from vaccinated and non-vaccinated broiler breeders challenged with *S. typhimurium* at one day of age through contact with “seeder” birds was conducted.

From this trial it can be concluded that vaccination of broiler breeders with Nobilis® Salenvac T leads to a significant reduction in shedding and a higher percentage of *S.typhimurium* negative broiler progeny.

Nobilis® Salenvac T induces excellent cross protection against other group B Salmonellae.

Nobilis® Salenvac T gives proven cross protection

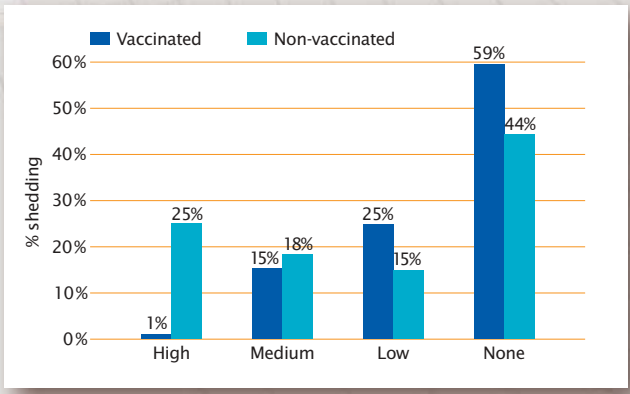
Nobilis Salenvac T reduces shedding of *S. enteritidis* and *S. typhimurium*. Additional trials show broader protection, including other group B Salmonellae (Kauffman-White classification scheme). Nobilis® Salenvac T induces the broadest Salmonella protection available from one vaccine, providing maximum confidence to the poultry producer.

Cross-protection studies

S. heidelberg and *S. agona* were selected for cross protection studies, as both are frequently isolated from poultry and associated with human food poisoning.

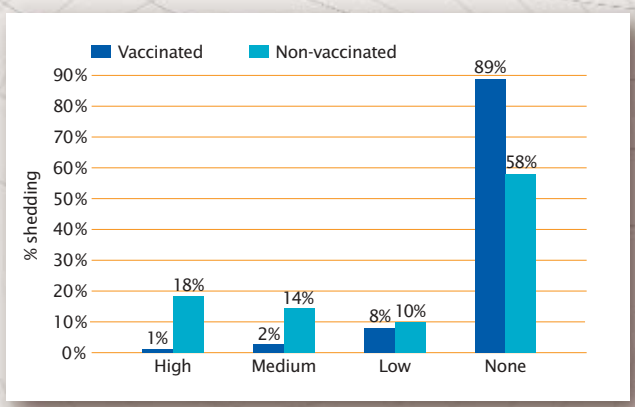
S. heidelberg study

Salmonella shedding through feces was monitored over a 21-day period following a *S. heidelberg* oral challenge of Nobilis® Salenvac T vaccinated chickens and a control group of non-vaccinated chickens.



S. agona study

Salmonella shedding through feces was monitored over a 21-day period following a *S. agona* oral challenge of Nobilis® Salenvac T vaccinated chickens and a control group of non-vaccinated chickens.



Group B Salmonella serotypes associated with poultry

Typhimurium
Heidelberg
Agona
Indiana
Paratyphi B java
Saint-Paul
Stanley
Bredeny
Chester

Nobilis® Salenvac T: broad spectrum Salmonella control for improved food safety

Nobilis® Salenvac T:

- A new, unique vaccine for the poultry industry, providing broad protection against both *S. enteritidis* and *S. typhimurium*
- Reduces both horizontal and vertical transmission of *S. enteritidis* and *S. typhimurium*
- Provides proven cross protection against other Salmonella serotype B infections
- Is formulated with a safe and highly effective aluminium hydroxide gel adjuvant
- Is grown under specialized conditions involving the restriction of iron nutrients, resulting in a vaccine that produces an immune response more relevant to a natural Salmonella challenge

TECHNOLOGY irp

Nobilis® Salenvac T from Intervet represents a significant advance in vaccine technology, providing the poultry industry with an essential tool to maximise the safety of pultry meat and eggs.

For more information on Salmonella control in poultry, please visit

www.safe-poultry.com

Nobilis® Salenvac T, the food safety vaccine

Description

Nobilis® Salenvac T contains inactivated cells of *Salmonella enteritidis* PT 4 and *Salmonella typhimurium* DT104. The vaccine contains aluminium hydroxide as an adjuvant and thiomersal as a preservative.

Indication

Nobilis® Salenvac T is indicated for the vaccination of breeder and layer type chickens against *S. enteritidis* and *S. typhimurium* infections.

Vaccination schedule

Normal vaccination schedule:
Two vaccinations of 1 dose (0.5 ml) with a minimum interval of 6 weeks. The recommended age for vaccination is 10 – 12 weeks for the first and 14 – 18 weeks for the second vaccination.

High risk of early infection:
The vaccine has been shown to be efficaceous when given at one day of age (0.1 ml) with a repeated dose (0.5 ml) 4 weeks later. This should be followed up with a booster dose at 14 – 18 weeks of age.

Administration

Administration is by intramuscular injection into the leg or breast muscle under aseptic conditions. The breast muscle is the recommended site of injection for broiler breeders to avoid the risk of leg injuries due to incorrect vaccination techniques.

Presentation

Nobilis® Salenvac T is available in 250 and 500 ml bottles.

Intervet Research Makes The Difference

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