The International Book of Stalosan® F
Stalosan introduction

Effect
Stalosan controls pathogenic microorganisms and maintain a healthy housing environment. By this the infection risk is reduced and the animals’ resistance is improved. As such, Stalosan F has proved to be effective when it comes to keeping several diseases under control including lawsonia, colon diarrhoea, malignant pulmonary disease, mastitis, salmonella infections etc.

Side-effects
For 24 years, Stalosan has been checked for side-effects through quarterly reports from veterinaries all over Denmark. Today, Stalosan has been on the market for more than 40 years and no side-effects has ever been reported from the use of Stalosan throughout this period.
In this period and subsequently, Stormøllen A/S has not received any complaints related to Stalosan not from Denmark nor from abroad. Therefore, the product may be characterised as being safe to use. Stalosan does not cause the development of resistant bacterial strains and can, therefore, be used continuously.
A housing hygiene agent for efficient control of:

- **Bacteria**
- **Vira**
- **Fungi**
- **Parasites**
- **Fly-larvae**
- **Moisture**
- **Ammonia**
- **Hydrogen sulphide**

Stalosan F fully meets the present increasing demands for fighting bacteria, vira, fungi, parasites, fly-larvae, ammonia and moisture in the housing units.

**Stalosan F does not cause the development of resistant strains.**

Now, with the latest development of Stalosan F we have finally succeeded in making a product, which is extremely effective on E. coli, salmonella, lawsonia, coccidia-oocysts and round worm eggs. In housing systems where slurry flies have been released, Stalosan F should not be used in those places where the slurry flies’ larva may come into contact with the product due to its damaging effect on insects.
Composition

- There is no “active” ingredient or chemicals.
- Three forms of very pure phosphate – 85%.
- A specialist structural clay material – 10%.
- A combination of specialist forms of iron and copper salts – 4%.
- An essential oil – 1%.

Mode of Action

- Stalosan is not cytotoxic - it does not invade or destroy cells.
- Stalosan works as an *absorbent*, attaching a wide range of pathogenic organisms onto its surface.
- Either the pathogen is attached or it is not, therefore no resistance can build up and many years of use have demonstrated this.
- The product does not act as a chemical does and so it remains active even in the presence of slurry or straw.
- It will remain active for many days.
- Its structure allows it to be a powerful drying agent.
- It works to bind Ammonia in the air and reduces Ammonia emissions by inhibiting Urease activity.
## Toxicity studies

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| **Acute Oral Toxicity**  
To provide information on health hazards likely to arise from a short-term exposure to Stalosan F by the oral route. | gained body weight | No gross Abnormalities were noted for any of the animals. | All animals survived and appeared active and healthy. There were no signs of gross toxicity, dermal irritation, adverse pharmacologic effects or abnormal behaviour. | The acute oral LD₅₀ of Stalosan F is greater than 5,000 mg/kg of body weight. |
| **Acute Dermal Toxicity Study**  
To provide information on health hazards likely to arise from a short-term exposure to Stalosan F by the dermal route. | gained body weight | No gross Abnormalities were noted for any of the animals. | All animals survived and appeared active and healthy. There were no signs of gross toxicity, dermal irritation, adverse pharmacologic effects or abnormal behaviour. | The single dose acute dermal LD₅₀ of Stalosan F is greater than 5,000 mg/kg of body weight. |
| **Acute Inhalation Toxicity Study**  
To provide information on health hazards likely to arise from a short-term exposure to Stalosan F by the inhalation route. | gained body weight | No gross Abnormalities were noted for any of the animals. | All animals survived and appeared active and healthy. There were no signs of gross toxicity, dermal irritation, adverse pharmacologic effects or abnormal behaviour. | The single dose acute dermal LD₅₀ of Stalosan F is greater than 5,000 mg/kg of body weight. |
| **Primary Eye Irritation Study**  
To provide information on the irritation likely to arise from an instillation of Stalosan F into the eye. | gained body weight | No gross Abnormalities were noted for any of the animals. | All animals survived and appeared active and healthy. There were no signs of gross toxicity, dermal irritation, adverse pharmacologic effects or abnormal behaviour. | Stalosan F is classified as mildly irritating to the eye. |
| **Primary Skin Irritation Study**  
To provide information on the skin irritation likely to arise from a single topical exposure to Stalosan F. | gained body weight | Not relevant | All animals survived and appeared active and healthy. There were no signs of gross toxicity, dermal irritation, adverse pharmacologic effects or abnormal behaviour. | Stalosan F is classified as non-irritating to the skin. |
| **Dermal Sensitization Study**  
To determine the potential for Stalosan F to elicit a skin sensitization reaction. | gained body weight | Not relevant | All animals survived and appeared active and healthy. There were no signs of gross toxicity, dermal irritation, adverse pharmacologic effects or abnormal behaviour. | Stalosan F is not considered to be a Contact sensitizer. |
The acute toxicity studies are performed with 5 g of Stalosan F per kg body weight. If those figures are projected to an adult human with a body weight of 80 kg, he can be exposed to 0.40 kg of Stalosan F either on the skin, through the gastro intestinal tract or through the respiratory system without being affected in any way. Further, he will avoid any irritation or sensitization to the skin caused by exposure to Stalosan F. Caution should only be taken with contact to the eye, due to the mildly irritant action, when Stalosan F is applied directly in the eye.

Due to the EPA approved toxicity, irritant and sensitization study, Stalosan F can be recognized as being a well documented product with few or no side effects. Still, our recommendation is to follow the guidelines from the safety datasheet of Stalosan F.

Jan Storgaard
M.Sc., Biochemistry/Biomedicine
Dosage instructions for Stalosan

Recommended dosage of Stalosan is 50 g/m2

By scattering
We recommend that Stalosan is scattered once a day for the first three days. Hereafter, Stalosan should be used once a week. For optimum effect, we recommend that Stalosan is spread as evenly as possible over the area the animals have access to.

General
In case of increased risk of infection spread (in case of stressful conditions such as new animals, before deliveries (in case of sheep and goats from six weeks before lambing), diarrhoea, inflammation of the udder, other infectious diseases, new staff, sudden changes in the animals’ immediate environment (e.g. burst water pipe)), Stalosan should be used once a day for three to eight days, as necessary. Hereafter, we recommend that you return to one dosage a week. If Stalosan is used in larger amounts it may be an advantage to target the dosage towards the critical areas such as damp places, areas with wasted feed, edges etc.
In general, Stormøllen recommends blowing out Stalosan rather than scattering it to ensure optimum spread of the product. Often, you will be able to reduce the consumption of Stalosan by changing from scattering to blowing out. The reason for this is that you are likely to overdose when using the scattering method.
Overdose of Stalosan does not give better results, but in certain cases, more frequent use may reduce the spread of infection from animal to animal and from housing to housing. More infection germs are excreted in stressful periods.

Consumption of Stalosan
See the section with calculation of consumption in different housing systems.

Personal protective equipment
Use approved mask with particle filter P2, overalls with hood and safety goggles (See safety data sheet for more information).
Application of Stalosan F with the use of a blower
Dosage instructions with blower

- **Recommended dosage of Stalosan F is 50 g/m² or 5 kg/100m²**

- Switch off any ventilation system before blowing out Stalosan F.

- Pour an adequate amount of Stalosan F into a bucket. Taking into account the blower’s range we recommend a maximum quantity of 5 kg Stalosan F for each blowing out.

- Place yourself safely, holding the blower in your left or right hand. The blower is designed for one hand operation.

- Dip the suction pipe of the blower into the bucket containing Stalosan F, leaving a small opening for air inlet.

- The exhaust end of the blower should point upward (15-45° from ground level) during blowing out and be moved from side to side. This procedure ensures optimum spread and distribution of Stalosan F. Tests show that a single spot allows a blowing range of about 100 m². One blow takes about 1-1½ minute. Under normal circumstances the blower can spread up to 8 kg Stalosan F per minute.

- For animal housings larger than 100 m², we recommend to split the area into sections of an appropriate size. In the case of a 500 m² housing, five strategic positions are required for optimum spread.

- To maintain the desired effect you need to blow out Stalosan F once a week.

- After blowing out, empty the blower of Stalosan F.
Consumption with pigs

**Stalosan F consumption:** The dosage is in all cases 50 g/m² per week about DKK 7 per kilo.

**Price:**
about DKK 0.58 per pig.

**Sows with pigs at 7 kg:**
It is presumed that the treatment is for an area of about 3 m² corresponding to a farrowing pen. The weaners are weaned when they are 4 weeks old and the treatment is started with 3 days in a row and after that once a week. That is 6 treatments per litter. One year sow has 2.3 litters a year.

50 g x 3 m² x 6 treatments x 2.3 litters = 2.07 kg per sow per year.

This amounts to a treatment price of about DKK 14.50 per sow per year

With 25 pigs per sow per year this corresponds to DKK 0.58 per weaned pig.

**Weaners 7-30 kg:**
Continued use once a week. We calculate 2.7 pen places per square meter, so this includes treatment of walks, disease pens etc.

A housing on 450 m² is estimated as 1,200 pen places. In case of a daily weight gain of 450 g, 7 batches can be made per year, i.e. in total 8,400 weaners from 7 to 30 kg. The consumption of Stalosan F is 50 g x 450 m² x 52 weeks. This results in about 1,200 kg Stalosan F per year and distributed on 8,400 weaners it results in about 140 g per weaner.

This gives a treatment price of 0.0140 x 7.00 = DKK 0.98 per weaner 7-30 kg.

**Sows with pigs to 30 kg:**
DKK 0.58 per weaner+ DKK 0.98 per pig 0-30 kg including the sow = DKK 1.56 per weaner.

**Growing-finishing pigs 30-98 kg.**
Continued use once a week. We estimate 1.27 pen places per square meter so this includes treatment of walks, disease pens etc.

Example: A housing on 450 m² is estimated as 570 pen places. Four batches a year can be produced, i.e. in total 2,280 growing-finishing pigs weighing 30-98 kg. The consumption of Stalosan F is 50 g x 450 m² x 52 weeks. This is about 1,200 kg Stalosan F per year. Distributed on 2,280 growing-finishing pigs results in about 500 g per growing-finishing pig.

The treatment price amounts to 0.5 x DKK 7.00 = DKK 3.50 per growing-finishing pig.

In feed consumption this corresponds to the pig eating about 3 kg feed less to even it out. The pig weighing 30-98 kg eats about 190 kg feed. So you need to save 1.57 per cent feed or about one day.

The purpose of using Stalosan F is to improve the environment in the housing by reducing the infection risk, reducing the ammonia fumes, dry out damp environments etc. Combined these factors lead to a better production result which is far higher than the cost of Stalosan F.
Consumption with dairy cows

**Stalosan F consumption:**  Dosage is in all cases 50 g/m² per week
**Price:**  about DKK 7 per kg.

**Cubicle and stanchion housing:**  about DKK 35 per cow per year

This presumes that an area of about 1.8 m² is treated. In the first week, you scatter the first three days and for the next 51 weeks once a week.

- First week: 1.8 m² x 3 treatments = 5.4 m²
- Next 51 weeks: 1.8 m² x 51 weeks = 91.8 m²
- Square metres in total per year per cow = 97.2 m²
- Consumption per year 97.2 m² x 50 g = about 5 kg
- Price per cow per year 5 kg x DKK 7 = about DKK 35

**Deep litter sections:**  about DKK 108.50 per cow per year

We estimate a resting area of 5.5 m² per cow. The first two weeks, you scatter about six times depending on the conditions and for the next 50 weeks once per week.

- 2 first weeks 5.5 m² x 6 treatments = 33 m²
- Next 50 weeks 5.5 m² x 50 weeks = 275 m²
- Square metres in total per year per cow = 308 m²
- Consumption per year 308 m² x 50 g = about 15.5 kg
- Price per cow per year 15.5 kg x DKK 7 = about DKK 108.50
Results from a laboratory test which shows the water-binding capacity of Stalosan F with ammonia to the right and without ammonia on the left. The same amount of Stalosan F has been used in both glasses but the glass on the right has been added less ammonia (approx. 1 per cent solution.)

Graphic display of the above test. 100 g Stalosan F binds up to 400 g water if ammonia is present.

(Stormøllen A/S 2004)
Absorption of water added 1 per cent ammonia when using 100 grammes of four different hygiene agents

(Stormøllen A/S, 2004)
Ammonia’s harmful effect on humans and animals

- **5 ppm** - The lowest amount you can smell
- **6 ppm** - Eyes and breathing are starting to become irritated
- **11 ppm** - The animals’ output is reduced
- **25 ppm** - Work hygienic extreme value for 8 hours’ stay
- **35 ppm** - The maximum value for 10 minutes’ stay
- **40 ppm** - Humans experience headaches, nausea and loss of appetite
- **50 ppm** - Serious reduction in output
  - Increased risk of pneumonia
  - Seriously deteriorated health with potentially lethal conditions
- **100 ppm** - Sneezing, spit secretion and serious irritation of the mucous membrane
  - Potentially lethal condition
Pigs infected with mycoplasma and pasteurella bacteria (ordinary complicated pulmonary disease) have more widespread pulmonary disease and grow more inadequately if they are also exposed to high doses of ammonia.

**Ammonia's influence on cases of pulmonary disease amongst growing-finishing pigs**

(mod.e. Health and safety in pigs 1999)
The ammonia evaporation from slurry after treatment with different products which reduce the release of ammonia. The study includes the most commonly used and efficient inhibitors of ammonia evaporation.

The study took place over 42 days and measurements were taken on day 1, 7 and 42. (Andersson M. 1994 Sveriges lantbruksuniversitet (Swedens Veterinary University))
Lawsonia results in the disease regional enteritis. It is estimated that lawsonia bacteria are found in more than 90 per cent of all Danish pig herds. Due to diarrhoea the feed conversion and the daily gain are reduced. Some pigs die from lawsonia.

Stalosan F effectively controls lawsonia and reduces cases of diarrhoea and deaths.

(Ibsen A, 04.2001)
Colon diarrhoea

Colon diarrhoea is a rapidly proceeding enteritis. The symptoms of colon diarrhoea are seen in the weaners in the first few days after the delivery when the pigs may have a white yellowish diarrhoea. They quickly become dehydrated and in a few days up to 50 per cent of the animals may have died.

(Steins 18.04.83)
Colon diarrhoea

When piglets are three weeks old, they may develop colon diarrhoea – so called 3 weeks’ diarrhoea. The diarrhoea is greyish white with a paste-like consistency. The mortality is lower than when new born piglets are infected with colon diarrhoea, up to 20 %. Untreated pigs become emaciated, get bristles and are not thriving.

The effect of Stalosan F on E. coli 0157

(Qvist 29.05.92)
Trial in egg laying house with coliform contamination:
- Stalosan was sprayed between week 2 and week 5.
- Swabs were taken before, during and after spraying.
- Coliform load reduced during spraying and returning to normal after spraying was stopped.
Salmonella

Most Danish pig herds are infected with salmonella. Still, only a few develop the symptoms of the infection. The slaughterhouses test for salmonella and restrictions and perhaps deduction in the payment are imposed on the infected herds.

Stalosan F controls all types of salmonella in the housing when used regularly.

(Steins 19.12.97)
Coccidiosis

Coccidiosis is caused by a unicellular parasite, *isospora suis*. In case of severe infections, when the piglets are five to ten days old, they will get a paste-like to very thin yellow diarrhoea which cannot be treated with antibiotics. Most disinfectants have no effect on the coccidies. Stalosan F blocks the coccidies’ life cycle and re-infection.

(Fishers Nutrition, England nov. 1999)
The surveys were carried out in two separate finisher housings. One with Stalosan F treatment the other as control. Apart from that, treatment, feeding, setup etc. were exactly the same in the two housing units. The pigs were bought from nearby weaner producers and were delivered to the slaughterhouse at minimum 80 kg slaughtered weight. The main problem with the herd was dysentery and, therefore, the registrations in connection with the survey were: Treatments with medicine and mortality with indication of cause.

A financial calculation shows that the extra profit was GBP 1.67 per growing-finishing pig when Stalosan F was used. This calculation includes only medication, Stalosan F and dead pigs. Pay for ”delivery” of the medication is not included, on the contrary the profit from fewer feeding days in the Stalosan F batches has not been taken into account.
Round worm

It is estimated that around half of all Danish pig herds are infected with round worm. Pigs with adult round worms in their intestines excrete thousands of eggs in the manure. Humans are infected by eating the ineffective eggs which can survive in the soil for up to six years. Pig manure and slurry should not be spread in fields or in gardens used for vegetables, strawberries or other crops.

It is estimated that the round worm reduces the feed conversion and the daily gain with up to 10 per cent in pig herds.

In this test, Stalosan F reduced the amount of round worm eggs with 87.5 per cent. As comparison, caustic lime achieved a significantly lower reduction with 63.2 per cent. Caustic lime is very harmful to both humans and animals contrary to Stalosan F which has never been shown to have any harmful effects.
Inflammation of the udder (Mastitis)

Mastitis is a complex disease and different management factors play a part. However, mastitis is basically caused by pathogenic bacteria penetrating the teat channel. The disease partly destroys the milk producing tissue and by that reduces the cow’s milk production for ever. Often, mastitis infected cows must be culled.

Decreases in milk yield in case of mastitis are as follows:

Sub-clinical mastitis: 5 – 10 % decrease in milk yield
The cow loses one teat: 15 – 20 % decrease in milk yield
The cow becomes dry: 100 % decrease in milk yield

(Steins, 18.04.83 Steins 17.03.97 Stormøllen 2004)
Previously, it was often infection from cow to cow that caused mastitis, but now it is instead environment bacteria which are the cause of most of the cases, often acute mastitis. First and foremost, environmental mastitis must be prevented by a clean and dry pen and a good housing climate. The costs of a mastitis case vary between DKK 1,450 – 4,850 depending on decrease in milk yield and increased culling. Approximately half of the Danish dairy cows are treated for mastitis.
(The Danish Agricultural Advisory Centre/Danish Cattle 2002)

*Streptococcus uberis* is the most frequent cause of mastitis in dry cows. The bacterium is normal on the teat skin as well as other parts of the body and is often found in the bedding material. Cure with antibiotics is often poor so prevention is very important.
(Blom and Jensen, 1996)
Malignant pulmonary disease is a serious pneumonia and perhaps the causing the most losses in modern production of finishers. About 80 per cent of the conventional herds are exposed to the disease.

Actinobacillus is the cause of malignant pulmonary disease. Stalosan F effectively impedes this bacterium in the housing environment.

Effect of Stalosan F on Actinobacillus (Chronic and acute respiratory infection)

Steins 18.04.1983
**Flies**

Flies bring many pathogenic microorganisms into the housing environment. These microorganisms come from other livestock and wild animals. Therefore, it is important to maintain a healthy hygiene level which provides poor living conditions for the flies and keeps them away.

An example of flies’ influence on the infection risk:
On a daily basis, almost 1000 flies invaded a broiler house through the ventilation system in July 2003. At least 30,000 flies made it into the broiler house during the production period of five weeks. 8.2 per cent of the flies caught around the broiler house were infected with campylobacteria. It is believed that 99.9 per cent of all infections with campylobacteria can be prevented by keeping flies away.
A large survey of the air quality in 44 finisher housings showed that 30 per cent of all the housings had toxigenic pasteurella multicoda (rhinitis) in the air.

A Dutch study showed that in herds with 30 per cent of the pigs suffering from lung diseases, the pig farmer has a seriously reduced lung function.

The study also found no impact on pig farmers with herds having less than 10 per cent suffering from lung diseases.

The effect of Stalosan F on Pasteurella multicoda

A Dutch study showed that in herds with 30 per cent of the pigs suffering from lung diseases, the pig farmer has a seriously reduced lung function.

The study also found no impact on pig farmers with herds having less than 10 per cent suffering from lung diseases.
**Parvovirus**

Infectious fetal death is caused by Parvovirus. Treatment is not possible and the disease must be seen as a large affliction in all areas of intensive pig farming.

Stalosan F reduces parovirus with 99.99 per cent
A 15 day test was carried out inspecting any advantages of Stalosan F treatment in farrowing houses. Two houses were selected each having 150 piglets. All conditions in the two houses were the same apart from the Stalosan F treatment.

Stalosan F was used with piglets for 15 days and compared to the conditions before the addition.
Turkeys

Turkey houses with and without Stalosan F treatment. The test was carried out on in total 80,000 turkeys.

- Mortality and culls (%)
- Ammonia (ppm)
- Litter quality

(Jones E. England)
Most feet problems occur as a result of cows’ feet becoming soft and then mechanical damage, e.g. stones, allowing bacteria to enter.

Conventional liquid footbaths are often used to help treat these problems.

Liquid footbaths can become inactivated very quickly by excessive contamination.

A dry footbath, using Stalosan, is not affected in this way.

Use about 3-5cm of powder for cows to walk through.

Allow to dry on the feet.

Frequency will depend on the severity of the problem.
A Broad Spectrum Disinfectant

Stalosan F has been tested against the following pathogens.

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<th>Virus</th>
<th>Parasite</th>
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<td>Aerococcus</td>
<td>Canine parvovirus</td>
<td>E. acervulina</td>
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<tr>
<td>Bacillus subtilis</td>
<td>ECBO-Virus</td>
<td>Fly Larvae</td>
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<td>C.pseudotropicalis</td>
<td>Newcastle Disease Virus</td>
<td>Ascaridia galli</td>
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<td>Candida parapsilosis</td>
<td>Porcine parvovirus</td>
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<td>Clostridium tyrobutyricum</td>
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### Comparison of Stalosan F with 6 different powder products

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<th>Product B</th>
<th>Product A</th>
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<td>More than 100 independent studies which show a high bactericide effect</td>
<td>Unusable test with 50 times recommended dosage.</td>
<td>No documentation</td>
<td>Very poor and limited documentation.</td>
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<tr>
<td>Fungi</td>
<td>More than 100 independent studies which show a high effect on fungi</td>
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<td>Vira</td>
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<td>Studies which show a high effect on coccidies (MAFF, England) And round worm (The Royal Veterinary and Agricultural University, Denmark).</td>
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<td>Insects</td>
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<td>Damp</td>
<td>High damp reduction (Rostock University, Germany)</td>
<td>Low damp reduction</td>
<td>Moderate damp reduction</td>
<td>Good damp reduction</td>
</tr>
<tr>
<td>Environment</td>
<td>No negative influence on the environment. Instead studies show improved quality of soil. (The Danish Institute of Agricultural Sciences Fouulum)</td>
<td>No documentation</td>
<td>No documentation</td>
<td>No documentation</td>
</tr>
</tbody>
</table>

The above information has been gathered by contacting the companies in question in April 2005.

*The importer of Prosanex, Hypred, does not recommend using the product with pigs as the product contains chlorine.*
### Comparison of Stalosan F with 6 different powder products

<table>
<thead>
<tr>
<th>Subject</th>
<th>Stalosan® F</th>
<th>Product D</th>
<th>Product E</th>
<th>Product F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td>More than 100 independent studies which show a high bactericide effect</td>
<td>No documentation</td>
<td>No documentation</td>
<td>No documentation</td>
</tr>
<tr>
<td>Fungi</td>
<td>More than 100 independent studies which show a high effect on fungi</td>
<td>No documentation</td>
<td>No documentation</td>
<td>No documentation</td>
</tr>
<tr>
<td>Vira</td>
<td>Studies which show a high effect on virus (log reduction on 4 to 7, MAFF, England and Rostock University, Germany)</td>
<td>No documentation</td>
<td>No documentation</td>
<td>No documentation</td>
</tr>
<tr>
<td>Parasites</td>
<td>Studies which show a high effect on coccidies (MAFF, England) And round worm (The Royal Veterinary and Agricultural University, Denmark)</td>
<td>No documentation</td>
<td>No documentation</td>
<td>No documentation</td>
</tr>
<tr>
<td>Insects</td>
<td>Studies which show high insecticide effect on fly maggots (Steins Laboratorium)</td>
<td>No documentation</td>
<td>No documentation</td>
<td>No documentation</td>
</tr>
<tr>
<td>Ammonia</td>
<td>Studies which show a significant reduction in the ammonia emission (Lund’s University)</td>
<td>Moderate ammonia reduction</td>
<td>No documentation</td>
<td>Moderate ammonia reduction</td>
</tr>
<tr>
<td>Damp</td>
<td>High damp reduction (Rostock University, Germany)</td>
<td>Low damp reduction</td>
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</tr>
</tbody>
</table>

The above information has been collected by contacting the companies in question in April 2005.
The documentation consists of effectiveness analysis where saltwater containing bacteria is added to Staldren. But in an amount which corresponds to about 50 times the recommended dosage. This corresponds to a consumption of 2.4 kg/m². The analysis have been performed at Stein’s Laboratory, but JN Jorenku has himself disclosed the used dosage of Staldren. The test cannot be used!

Dosage used in tests:

- 48 handfuls of Product C /m²
- 1 handful of Stalosan F /m²

50 g Stalosan F corresponds to about 1 handful
2.4 kg Staldren corresponds to about 48 handfuls
Hygiene is important

As Andrew Bygrave, veterinary adviser, recently commented "There is life after Emtryl*, but maximum hygiene, alongside other bio-security measures, will be paramount if you are going to avoid major loss"

*Medicament for prevention and control of swine dysentery and for treating histomoniasis in poultry.
Stalosan is marketed in South Africa and neighboring counties by:

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