

**MENNO®**

# Hygienemanagement



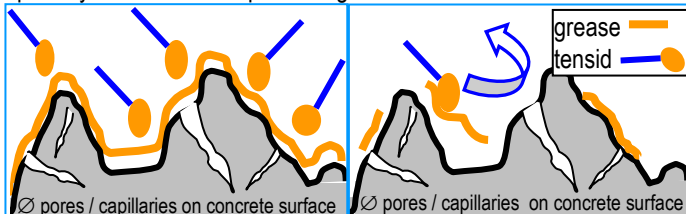


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## 1 In general

### 1.1 Cleansing

Basic requirement for efficient disinfection is thorough cleansing of all surfaces first. As pores and capillaries of concrete surfaces are coated and sealed by a greasy film of remains from feed, manure and urine, this needs to be removed by using suitable cleansing agents. Cleansers includes cleansing agents, tensids and may be on the acid side, alcalic, or neutral – there are cleansers for every kind of task, specially formulated for special targets.



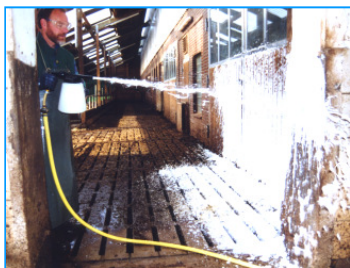
The "lipophile" (grease-friendly) part of the tensid helps to dissolve the grease-coating and enables its hydrophile (water-friendly) part to rinse it off in a water solution, along with the waste water.

Crucial in choosing the right cleanser are following questions:

- Which concentration is needed to thoroughly remove all dirt and grease? This should not be determined as a question of price per kg!
- What kind of surfaces are intended to clean (i.e. metal, concrete, plastic, etc.)?
- What about material tolerance towards the cleanser?

A thorough cleansing job can be obtained by following the three steps below:

- 1) **Pre-cleansing** - use water, shovel, broom, etc. - to mechanically clean surfaces from manure, leftover feeds, straw and the like.
- 2) **Apply** - without pressure - cleanser-solution (for instance MENNO® CLEAN in 1 to 5 % solution) deliberately as a foam – **let it soak in and work a couple of minutes.**
- 3) **Clean** all surfaces thoroughly, using a high-pressure-cleanser with lots of water, rather high pressure and again, use of cleanser.



**BEWARE:** concrete will soak up lots of water during cleansing, thus further deluting the concentration of a disinfectant-solution and reducing effectiveness!

**THAT IS WHY:** after cleansing, **let dry all concrete surfaces until they have a characteristic „gray shine“**, indicating they are dry enough to proceed with disinfecting - successfully!

### 1.2 Disinfection – basic requirements

In order to help users to evaluate the effectiveness of disinfectants the **Deutsche Veterinärmedizinische Gesellschaft** (German Veterinary Association) issues the **DVG-Liste für die Tierhaltung** (DVG list for animal keeping). Here, directions for concentrations in relation to the required acting-times are listed. Required amount of using-solution is assumed to be 0,4 l/m<sup>2</sup>.



**Never** mix different disinfectants into one solution! Also refrain from adding cleansers! As this might have a negative influence on effectiveness, DVG-statutes forbid this!

A disinfectant should be one awarded the **DLG-Gütezeichen** (Deutsche Landwirtschaftliche Gesellschaft / German Agricultural Association - Quality-Seal), as during testing for its requirements, disinfectants are checked for their corrosiveness, ease of solution in water, suitability for use in occupied stalls / presence of animals etc.



Trademark disinfectants on the market usually contain, beside their active ingredients, some tensids as needed. These tensids are working as "carriers", transporting the active ingredients through possible remains of dirt into the concrete's structures, like fissures, or tiny holes.

**Disinfection against bacteria, fungi and viruses** must include all surfaces as: floors, walls, ceilings, interiors, air-ventilation-systems, feedstuff-silos, mangers / waterers, boots, equipment, vehicles, and so on.



**Disinfection against excreted endoparasites** must include all surfaces that have been subject to contact with manure: floors, walls and interiors (these up to a height of app. 1 m from the ground), boots, mangers, waterers, loading ramps / chutes, etc.

The disinfectant solution is applied in recommended concentration and amount. To ensure the required acting-time **it is not necessary to keep surfaces damp or wet.**

Afterwards it is not necessary to rinse off the disinfectant-solution of surfaces – just let it dry.

### 1.3 Methods of application:

#### a) Backpack sprayer (not recommendable):

These sprayers have a tank-capacity of about 10 liters – these allow, using the recommended 0,4 l/m<sup>2</sup>, to treat a surface of only 25 m<sup>2</sup>. Applying an effective amount of solution to larger areas is much too work-intensive. This may lead to inappropriate, "hasty" work, and this in turn will result in:

- Too small amount / concentration of active substance on surfaces – impossible to work efficiently.
- If ultra-fine spray-nozzles are used, a fog is generated that is annoying to human and animal for smells, and even worse, is harmful if inhaled.





## b) Fog-generators / fogging machines (not recommendable):

Fog generators are constructed for technical reasons with a comparably small storage tank. To obtain sufficient amounts of active substances on the surfaces, high-concentrated premixes are used, along with a too low portion of water.

The effectivity of commercial disinfectants relies on combined action of water, tensids and active ingredients to ensure the tensids enable the water to transport the active substances deep into pores and capillaries of the concrete.

Results of this inefficient application:

- Active substances stay up on outer layer of surfaces, with too little water present to transport it down into the structure.
- A mist of active substances can reach mucous membranes of mouth / nose and is felt to be annoyingly smelly.
- Dangerous exposition to these mist of substances for humans / animals.
- Beware: safety requirements for workers regulate use of fog-generators to a high extent (see German applicable law / regulations GefStoffV [1] Annex III No. 5 Begasung), plus: personnel is required to have certificate of qualification and official authorization to perform disinfection that way!

## c) Self-mixing high-pressure machine / automatic dosing (not recommendable):

Specific viscosity of different disinfectants cannot be recognized by these machines and consequently no exact water/disinfectant solution ratio is assured, merely an unsure "circa-dosing" is achieved.

## 1.4 Recommended application

The self-mixed disinfection solution can be applied by use of a plant-protection sprayer, or a self pumping high-pressure machine supplied from a separate tank or 200 liter barrel.

The **Ready-to-use-solution should be mixed in exact concentration by the user himself!** Use appropriate container, like watertank or 200 liter barrel, fill in water first, then add disinfectant – concentrate, stirring to promote dilution.

Example for a 1 % ready-to-use-solution:

- 198 ltrs. of water + 2 ltrs. concentrate = 200 ltrs. ready-to-use-solution.
- Sufficient to disinfect up to 500 m<sup>2</sup> surface.

**While disinfecting, use reduced pressure (max. 5 bar), reduced flow-through-rate (max 10-15 ltr. per minute), big droplet size and spray nozzle set to "wide".**

All surfaces that need to be disinfected must be soaked by the solution. Successful disinfection needs proper work and time!

Because of its easy and safe handling the applicator below is a valuable help for the chores of disinfection:

### MENNO® Disinfectant Applicator / Foam Generator System 2:



- **Foam as visual control:** ensures all surfaces are treated evenly.
- Also, **foam ensures longer exposure times**, even on smooth and vertical surfaces.
- **Eliminates health-hazards for man / animal:** no fog or mist to be inhaled.

The MENNO® Disinfectant-applicator connects easily to a garden-hose plugged in directly by a quick release coupling. It adds the MENNO® product in just the right concentration while the water flows through.

One fill of the concentrate tank (holds 3 Liters) is good for 300 Liters usable solution in 1 % concentration. This is sufficient to treat an area of 750 m<sup>2</sup>.

## 1.5 General Legal Conditions

Surface-disinfectants for hygiene in the veterinary field are considered to be BIOCID-Products and are subject to guideline 98/8/EC, product group 3, of the biocide-law from 20.06.2002.

Only products with the **baua: Reg. Nr.-XXXXX** are considered marketable since 28.02.2006 in Germany. For biocide-products, it is mandatory to declare the **expiry date** as well as the **production-lot number**.

It is the prospective user's responsibility to choose a product, considering **effectiveness, toxicological acceptability and potential of hazard to the environment**.

According to § 7, **regulation for dangerous goods, informative investigation and assessment of risks [1]**, an employer (or, if necessary, an extern expert consultant) has to evaluate the dangerous characteristics of substances or products, using **Material Safety Data Sheets, information on label and producer's information about the product**.

Contamination of work-areas and hazards towards employees has to be kept at the lowest possible level. To comply with this liability, an employer has to preferably **make use of substitutes**. Especially the handling and use of dangerous goods is to be avoided – else, dangerous goods have to be replaced by products, substances or procedures that are, under same conditions of usage, less hazardous to safety and health of employed personnel.

Failure to use an opportunity for substitution has to be documented and explained in a written statement of assessment of possible danger.

	Protection level 4	R	M	K
	Beside symbols R, M, K not legal binding yet	Reproduction endanger	mutagenic	cancerogenic
	Protection level 3		T+	T
			T+ Very toxic	T - Toxic
	Protection level 2	C	Xn	Xi
		C - Corrosive	Xn - Harmful	Xi - Irritant
	Protection level 1	C	Xn	Xi
	Low amount, minor exposition	C - Corrosive	Xn - Harmful	Xi - Irritant

## 2 Disease prevention

### 2.1 Disinfection with raw materials?

In case of notifiable diseases, applicable animal-disease-regulations are binding, as well as orders by veterinary authorities.

Guidelines for Disinfection in case of notifiable diseases, 323-3602-19/1-as per February 2007 mention, besides trademarked products, raw materials as well: the substance formaldehyde (formalin, 35-37% watery formaldehyde-solution) is in case of notifiable diseases:

**„at temperatures below + 10 °C insufficiently effective, at temperatures between + 10 und + 20 °C relation of efficiency to temperature is to be considered“**

Others mentioned are: peraceticacid, formic acid, slake, soda lye, etc. Raw materials are not offered, declared or sold as disinfectants, this means no claim for effectiveness against diseases in the environment of humans or animals is made.

Producers are not to be held liable for these kinds of indications. Raw materials as, per instance, formic acid, soda lye, peracetic acid are known to be quite corrosive to metals!

Only if raw materials are ordered to be used by authorized individuals (like county veterinarians, appointed farm veterinarians etc.), there is an **indication**, and, consequently, a **liability** taken over by these authorized individuals / organizations.

## 2.2 Surface-disinfection with formulated trade products

Producers of brand name disinfectants cover their liabilities by liability-insurances, and are liable for characteristics and effectiveness they indicate and advertise for their products.

„Formulated from organic acids, the disinfectant **VENNO® VET 1** proves to be **very effektiv, even at low temperatures**, this means, it has little “cold defect” (Prof. Dr. Kaden, Federal Research Institution for Viral Diseases of Animals, Isle Riems, in “Amtstierärztlicher Dienst und Lebensmittelkontrolle”, 4. Year I/97, pages 48 ff.). Effectiveness of **VENNO® VET 1** has been tested according to DVG-guidelines at temperatures of **+ 20 °C, + 10 °C, + 4 °C and -10 °C** in germ-carrier-tests against swine fever as well as foot and mouth disease.



Germ	Disinfectant Exposure time (min)	Effective concentration of disinfectant (given in %)									
		RT			+10°C			+4°C			-10°C*
		W	R	A	W	R	A	W	R	A	
FMD	15										n.t.
	30										n.t.
	60										
	120										
CSF	15										n.t.
	30										n.t.
	60										
	120										

Tab.1: Effectiveness of different **VENNO® VET 1**-concentrations against FMD and CSF viruses in germ carrier test [2]

### Legend:

W Wood (poplar) FMD Foot and Mouth Virus  
R Rubber CSF Classical Swine Fever Virus  
A Aluminium DI Disinfectant  
n.t. not tested EPT exposure time  
\* Propylenglykol RT room temperature  
added to disinfectant

DI concentration (%) starting to be effective		
0,5	1,0	2,0



This means there is a disinfectant available for prevention or extinction of diseases with effectiveness even at low temperatures, down to -10° C. This is important for disinfection of vehicles, loading areas like ramps or chutes, rubber boots etc.

Freezing of the usable solution is prevented by adding quantities of Glykol as shown below.

Temperature	0 °C	- 10 °C	- 20 °C	- 30 °C	- 40 °C
Mass-%	10	25	35	45	55

Tab. 2: freezing-points of ethylenglykol-water-mixtures

## 2.3 Passage-pools and boot disinfection

Cold, contamination with dirt, dilution by rain, and carry-off by vehicle-tyres impose demanding tasks for efficiency. Dip-in or Drive-through-solutions may only be used as long as they appear visually clean. General recommendations for length of use cannot be given – too much depends on frequency of use as well as degree of dirt carried into the solution.



A handy helper to estimate a using solution of **VENNO® VET 1** are strips of **indicator - paper** to monitor the **pH value** of the solution.

Depending on the water used, pH value of a 1 % ready to use solution is between 2,5 to 3,0.

Disposal of larger amounts of leftover-solution needs to be approved by local authorities regulating handling of waste-water. Only products that are bio-degradeable and will not harm cleaning units in local sewers/water cleaning facilities may be dumped.

- Bacteriostatic of **VENNO® VET 1**, G-value 200 mg/l [3].
- Biodegradability **VENNO® VET 1**, good biodegradable, 86 % [4].

## 2.4 Sanitation of liquid manure

All expertises quoted below (from Federal Research Institution for Viral Diseases of Animals, Isle Riems) are available on demand:

[5] For **VENNO® VET 1**, par. „4. recommendation:...

**Liquid manure of cattle or swine with FMD-Virus:** 3 % final concentration, 16 hours exposure time

**Liquid manure of swine with CSF-Virus:** 2 % final concentration, 4-16 hours exposure time“

[6] CSF-Virus in liquid manure of swine, par. „4. conclusion:., 4.2.1 liquid manure, undiluted – in testing areas + 10 °C and + 4 °C it can be assumed, that a 0,5 % **VENNO® VET 1** super-concentration in liquid manure at exposure times of ≥4 h is sufficient to inactivate CSF-Virus.“

## 3 Endoparasite-control

### 3.1 Why endoparasitecontrol?

Endoparasites, like roundworms (*ascaris suum heterakis*, etc.) coccidia (*isospora suis*, *eimeria tenella*, *cryptosporidia*, etc..) infect internal organs and are prone to cause considerable economic loss in animal keeping, as they can lead to poor feed conversion, diarrhoea, reduced weight gains and -in bad cases – may even lead to loss of animals.

Most endoparasites are following a direct development-cycle. Infected animals pass worm-eggs or coccidia-oocysts with their manure- these are infectious for other present animals, if taken in. Treating infected animals with dewormers or coccidiostatics gives only temporary relief, as only adult stages are destroyed **within the animal**. This is not sufficient!

**Successful treatment** of endoparasites must include efficient **deworming / use of coccidiostatics** as well as **disinfection at just the right time**.

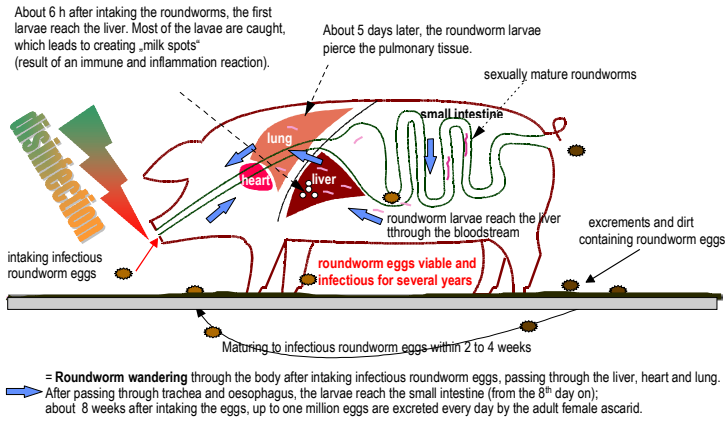
Range of efficiency and way of acting of the chosen dewormer have to be considered. **Dewormers** are only effective against adult worms, or some stages of larvae inside the infected animal.

For a time of 8-10 days after deworming, worm-eggs can still be passed by the host-animal. One single female roundworm can pass up to **1.000.000 (1 million) eggs per day**.





## Roundworm development cycle



In case of **Coccidiosis**, like *isosporea suis* (piglets diarrhoea) or *cryptosporidiosis* (diarrhoea of calves), medication as well as disinfection of the surroundings of the infected animals become necessary. This means, surfaces in partially occupied stables and barns must be disinfected.

In poultry-fattening operations, *eimeria tenella* oozysts can be efficiently eradicated by means of disinfection.

Without effective disinfection, excreted endoparasites (prevailing forms, i.e. eggs, oozysts...) can remain on surfaces, surviving for months, even years, still potentially infectious for animals.

## 3.2 Antiparasitical effectiveness requires a special disinfectant

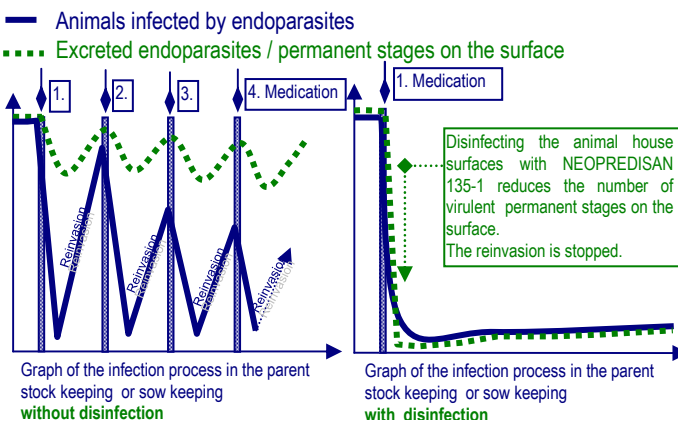
Columns 8a and 8b have been added to the DVG-list for animal keeping for these special indications, attesting effectiveness against worm-eggs and coccidia.



The product NEOPREDISAN® 135-1 has been included into the DVG-list as proven to be effective against excreted endoparasites and their persistent forms, thus drastically reducing the risk of re-infection through not disinfected stable-surfaces.

Using NEOPREDISAN® 135-1 increases the effectiveness of dewormers and coccidiostatica.

By disinfecting after use of medication it can be ensured, that none of the excreted endoparasites can re-invade the animals!



## Hygiene is essential in eradicating endoparasites.

Insufficient are following measures in battling excreted endoparasites:

- Use of heat / warmth such as "hot" water, scorching with open fire, chalk/lime. The persistent forms (as worm eggs, coccidia oocysts) are killed only at temperatures above 80° Celsius...
- „Hot“ water cools down far too quick on the surfaces, open fire is not an option to use in stables, and chalk/lime would have to be used in quantities of ca. 8 kg/m<sup>2</sup> [7] to reach this temperature-range.

Following substances are not known to have sufficient effectiveness against parasites:

- aldehydes: formaldehyde, glutardialdehyde, etc.
- organic acids: formic acid, acetic acid, etc.
- oxygen-releasing compounds: peracetic acid, hydrogenperoxyd, kalium-hydrogen-peroxomonosulphates, etc.
- quaternary ammonium compounds: benzalkoniumchloride, didecyl-dimethylammonium-chloride etc.
- Iodophoric sequestering agents, iodine-releasing compounds...

## 3.3 Animal washing – not to be forgotten

Ensure animals are internally free from parasites by use of medication, eradicate persistent forms of endoparasites on surfaces by disinfecting these surfaces. **AND consider one further step towards relieving your stock from endoparasites, and break the re-infection cycle:**

Worm-eggs (helminthic-eggs) are covered by an **extraordinarily sticky surface** which makes them cling to the animal's skin and hair.

In battling endoparasites, this characteristic has to be considered, and three steps have to be taken to avoid re-infection and achieve a parasite-free stock:

- 1) medication: deworming
- 2) animal-washing against sticky eggs
- 3) disinfection against excreted stages on the surfaces



The applicator shown at left enables the safe and easy washing of animals, which is highly recommendable for the reasons explained above.

## 4 Pig / hog raising operations

### a) piglet-producers:

- 8-10 days before expected date of giving birth deworm sow in waiting box-stall (determine weight of animals for exact doses).

before moving sow into farrowing box:

- 1) wash sow (hide, hair and claws) while still in waiting-box with: **VENNO® OXYGEN Special Animal Detergent ⇒ 2 %**
- 2) disinfect walkways and boots with: **NEOPREDISAN® 135-1 ⇒ 2 %**
- 3) disinfection of:

farrowing-box before sow moves in:

- basic disinfection with:  
VENNO® FF super ⇒ 1 % or  
VENNO® VET 1 super ⇒ 1 %
- After drying, disinfection with:  
**NEOPREDISAN® 135-1 ⇒ 2 %**
- 4) deworm piglets 6 weeks of age or 8-10 days before shipping to feedlot



**b) Feedlot - fattening operation/  
stabling out-of-own-system/  
dewormed piglets:**

into thoroughly cleaned and disinfected boxes,  
walkways and boots are to be disinfected with:  
NEOPREDISAN® 135-1  $\Rightarrow$  2%  
disinfecting fattening compartments/  
quarantine-boxes:  
basic disinfection with:  
VENNO® FF super  $\Rightarrow$  1 % or  
VENNO® VET 1 super  $\Rightarrow$  1 %  
After dry-off disinfection with:  
NEOPREDISAN® 135-1  $\Rightarrow$  2 %



**c) Animals coming from multiple outside suppliers,  
unconfirmed status of parasite infection  
(possible parasite-carriers)**

stable up into thoroughly cleaned and disinfected compartments:

- 1) deworm piglets
- 2) clean up stall after 8-10 days (broom-and-shovel)
- 3) wash piglets with  
VENNO® OXYGEN Special-Animal Detergent  $\Rightarrow$  2 %
- 4) then disinfect all surfaces of compartment with  
NEOPREDISAN® 135-1  $\Rightarrow$  3 %

**d) treating the whole stock against endoparasites:**

Boars: 2 to 3 times yearly  
Sows: at least 2 to 3 times yearly as whole-stock treatment,  
or at least 10 days before moving into farrowing-box.

Young sows that shall be  
integrated as remounts have  
to be taken into the same  
deworming / disinfecting  
program!  
Medication against parasites  
is to be given twice a year in  
quarantine-stall. Strictly  
observe all IN / all OUT  
principle!



Disinfect after animals have left.

Hygienic precautions:

Wash all animals 8 – 10 days after deworming, then disinfect  
surfaces with NEOPREDISAN® 135-1, to make sure re-infection is  
kept as far away as possible!

**5 Poultry operations**

Problematic in poultry keeping  
are especially coccidia of the  
*Eimeria*-strain.

The highest economic damage is  
done by *Eimeria tenella* oozysts,  
anyhow, these can be battled  
succesfully by disinfecting the  
surfaces of housings / cages  
with NEOPREDISAN™ 135- 1  
before moving in the birds.



coccidia oozysts *Eimeria tenella* 30 – 70 µm

Procedure for fattening operations chicken / turkeys:

- 1) thoroughly clean after last population has left.
- 2) After drying – basic disinfection of all surfaces against  
bacteria, fungi and viruses with:  
VENNO® FF super  $\Rightarrow$  1 % or  
VENNO® VET 1 super  $\Rightarrow$  1 %
- 3) After drying – special disinfection of walls (up to 1 m height) and  
floors against endoparasites with:  
NEOPREDISAN® 135-1  $\Rightarrow$  3 %

**6 Cattle- and dairy operations**

**6.1 Intermediate disinfection of milking rigs**

Mastitis can become a huge problem, being transferred via the milking  
rigs from infected to sound animals, spreading through whole dairy  
herds.

Increased cell and germ-counts in the milk mean financial loss to the  
operator and can, in the worst case, even mean the milk is rejected by  
the dairy.

During intermediate disinfection of rigs/clusters organic load, like milk,  
is carried into the solution, considerably reducing effectiveness of the  
disinfection.

VENNO® OXYGEN disinfectant has  
been tested under practical conditions,  
using a realistic dipping time of 2  
minutes, and delivered wide-range-  
atimicrobicidal effectiveness. „Proven  
effects are given for simulated  
disinfection of about 50 milking rigs  
under cowshed milking conditions  
(bucket disinfection), and of about 400  
milking clusters in milking-machine  
installations (rotary milker, disinfecting  
the milking rigs by rinsing them in a  
tub). Dosage: 0,5 % / 2 minutes.“[8]



**7 Animal-keeping drinking water hygiene**

Inside the watering-system there can be a very high build up of germs,  
up to  $10^8$ , for instance.:

- escherichia coli,      • streptococcus,      • salmonellae
- enterobacter,      • pseudomonas sp      • fungi
- micrococcus,      • aerobic spore-builders      • yeasts

It is unavoidable that microorganisms find their way into the water.  
This may happen from the tank, by way of leaking fittings, faucets, or  
the animals waterer-valves. Inside the widespread tubing-system the  
water may warm up to the rooms temperature of 25 – 30 °C.  
To obtain a better solution of medication, sometimes "sugar-solutions"  
are added. At these, for micro-organisms, favorable conditions they  
can multiply in exorbitant dimensions.

This massive germ-count, along with toxic material (from bacteria and  
fungi) have their effects on the animals health and may lead to  
shrinking gains, and even total loss of animals. During the fattening  
cycles vitamins, antibiotics, vaccines etc. are given via the drinking  
water system. High germ-counts have counter-productive effects and  
reduce efficiency of these additives.

Use of chlorine (natriumhypochlorit, NaOCl), peracetic acid or  
hydrogenperoxyde ( $H_2O_2$ ) is not recommendable. Under the extreme  
conditions outlined above these agents work off far too quick with the  
toxins and other "burdens" and will be only isufficiently effective.

**7.1 Basic sanitation in empty stable**

**Basic cleaning:** continous use of alcalic cleansers on a regular  
schedule.

**Goal:** Thorough cleansing with MENNO® CLEAN and pH-value  
change (alkalic/acidic) removes deposits from algae, iron, lime,  
proteins, and additives. Enclosures of microorganisms in these  
deposits are reduced, and rendered more receptive towards the  
"acidic" sanitation with VENNO® VET 1.

**effectiveness:** bactericid, fungicid und virucid

**active substance:** 50 % formic acid

**applicable solution:** 1 %,

**Expertise:** On effectiveness of the chem. disinfectant

**VENNO™ VET 1 against germs in drinking water from occupied  
poultry- and turkeystables in comparison to other preparations,**  
Dr. Dr. habil H. M. Hafez, Staatl. Tierärztliches. Untersuchungsamt  
Stuttgart

Toxicology of VENNO® VET 1

- „practically nontoxic“, at 8.000 mg/kg“ (tested 2 % solution) [9]





## 7.2 Procedure of basic sanitation

- Let water drain from the complete system (including connector pipes to waterers). Take off waterers (like bowls or nipple-drinkers) and clean and disinfect in separate tub / bucket. Close connector pipes with plugs.
- Fill up the whole piping system with a solution of the alcalic cleaner MENNO® CLEAN and afterwards (!) a VENNO® VET 1 solution. (avoid to mix these solutions in any case!). Take off the plugs from the connector pipes to let off air, wait till solution is dripping out.
- Technical possibilities given, pump solution revolving through system.
- Let solution drain from system and rinse clear piping system with sufficient quantities of water. Residues of solution can be detected by checking the pH-value with indicator paper.
- Next step after cleaning is disinfection. Follow same procedures as with cleaning, then drain piping system from disinfectant solution, carefully rinse out system with clear water, again checking for residues of disinfectant by monitoring pH-value with indicator papers.
- Keep rinsing with clear water till pH-value turns to neutral.

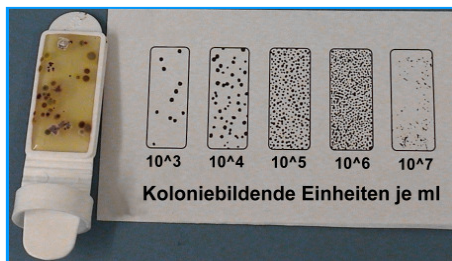
## 7.3 Continous sanitation

Crucial are **multiple check-ups for water quality** and presence of **micro-organisms** as well as **germ-counts** in your watering-system.

Water samples must be taken directly from the drinkers (bowls or nipples), and should be drawn from the far end of the line.

INDUTEST enables to determine the total germ-count contained in the water in just two days.

Germ-content over  $10^3$  germs indicate that immediate action like a complete analysis and afterwards effective sanitation is necessary.



### The investment for this check-up pays off:

- Is the germ-count too high and the catalog of action required?
- Are the chosen agents efficient – is the germ-count reduced?
- Which dosage is required in any specific case, and how often is the treatment needed?

## A-QUASAN®

Active substance: organic acids

applicable solutions: 0,3 to 0,5 % - 0,3 to 0,5 l in 100 Liter

how to use: add to water via flow-tank or commercial dosers (like used for adding medication to drinking water).

When to use: preventive and always after „sugary solutions“ have been given (for medication etc.) and if rising germ-counts call for action.

Evaluation: „The In-vitro-trial has shown that the disinfectant A-QUASAN® is capable, in concentrations of 0,50 % and 0,33 % in drinking water, to achieve a distinct reduction of the content of mesophile and psychrotolerant germ-content.“ [10]



## 8 Bibliography

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MENNO documentation:

All expertises and sources are available on request.

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