

The most effective
drinking system cleaner





*"Everybody has the right
to drink clean water"*

The most effective drinking system cleaner

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1. Obligation Intracare

Intracare, quality and innovation are our obligation.

More than 20 years an authority in water treatment general and several activities in the intensive livestock area world wide directly have developed the experience required to excel in today's global marketplace.

Our expertise is manufacturing and product development in corporation with our partners. The long lasting connections to our suppliers of raw material, as well as the evaluation of the raw material are the basis.

Control of incoming goods, laboratory analysis, and a careful, precise production make the basis of the Intracare's products.

Laboratory- and production tests accompany them from the beginning to the finishing, just for the quality of our products.

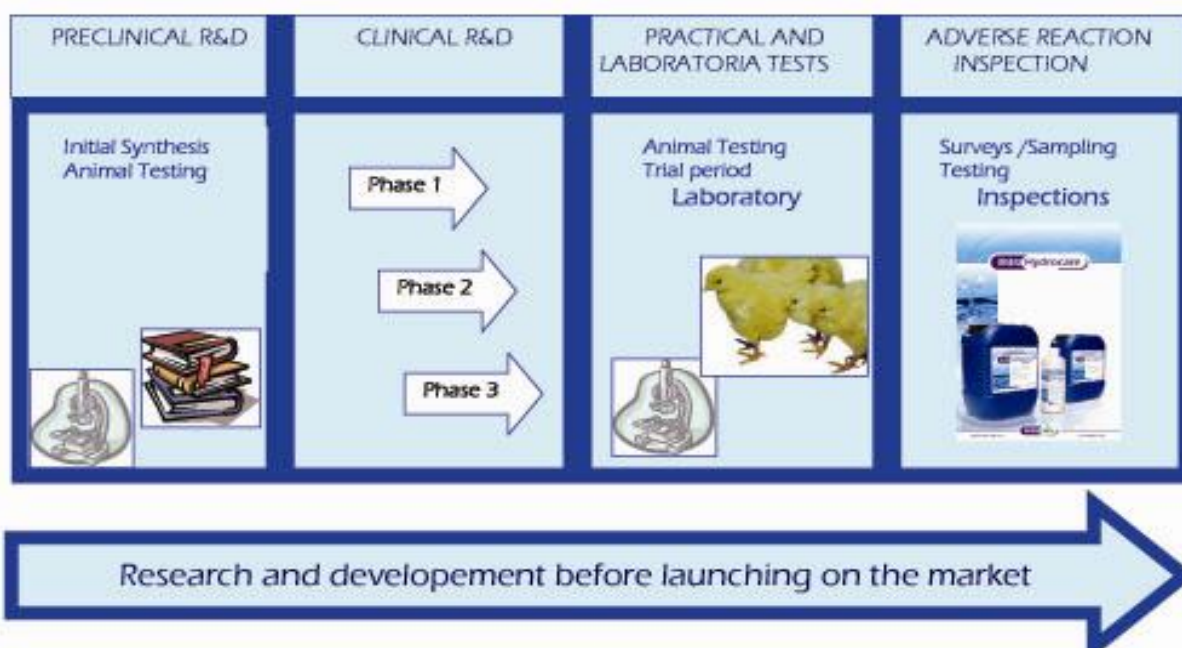
Intracare invests in equipment of highest technical standard for production, quality control, handling and storage of all their products.

All of our raw materials and final products are in accordance with the latest safety requirements regarding technology, dermatology and environmental protection regulations.

It is this diligent selection process and the high-quality reputation our line of products has in the marketplace that allows us to virtually guarantee success for our trading partners.

Our commitment to you as a partner does not end with the first sale. We provide you with the technical support and marketing tools necessary to enable your team to earn a competitive advantage with well-rounded, consultative strategies. Intracare devotes itself to the growth of your business.

Intracare achieves global activities and placement at competitive prices without sacrificing service.



2. Introduction

In our everyday lives we are virtually unaware of the fact that water is a primary necessity of life for both man and animals – which is odd, and certainly when it is realized how many problems can occur with the quality of drinking water, such as problems caused by contamination of the drinking water system. Problems with the quality of the drinking water not only pose a risk to the health of the animals; they also exert a detrimental influence on the effect of medicines, vitamins and vaccines administered in the drinking water – as a result of which the effectiveness of these supplements can be reduced by more than 20 percent.

Moreover the use of medicines or nutritional supplements can also result in blockages in the system – as a result of which the animals can no longer drink, or the drinking water system develops leaks.

All these problems can be avoided with appropriate cleaning. Intracare can help you ensure for the suitable cleaning of your system. We can advise you in the preparation of an appropriate cleaning strategy for your drinking water system; moreover our Intra Hydrocare constitutes an ideal cleaning product for your needs. Intra Hydrocare offers a simple means of cleaning your entire drinking water system, both during and after the production period, and inclusive of the storage tanks, pipe lines, and nipple, cup, and other drinkers.

3. Causes and consequences of contaminated drinking water systems

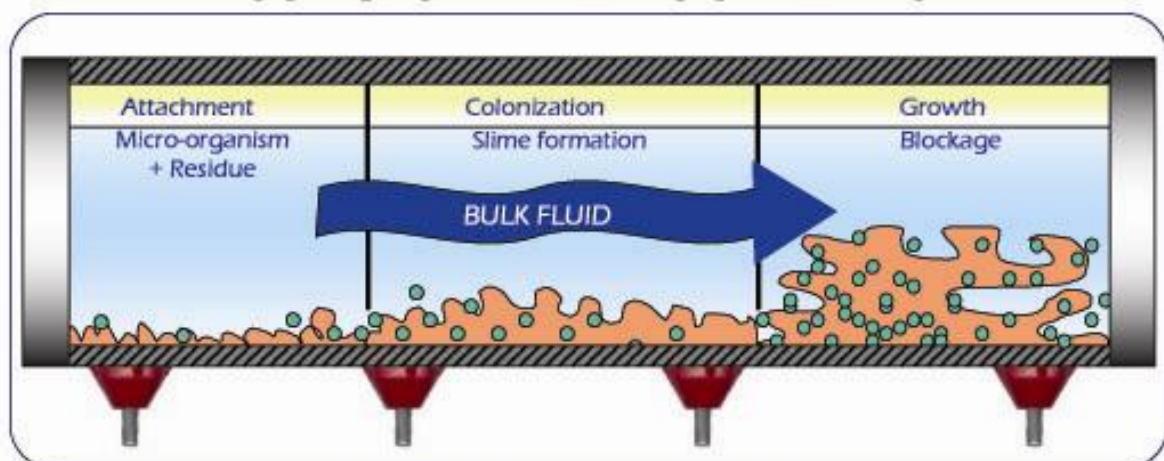
Additives administered in the drinking water such as medicines, vitamins, vaccines and nutritional supplements leave traces (residues) in the system that constitute a perfect nutrient medium for micro-organisms. In combination with the residues these micro-organisms in turn result in the development of what is referred to as a 'biofilm' in the drinking water system, which is a slimy mass that constitutes a risk both to the quality of the water and to the operation of the drinking water system.

Moreover there is a risk of interactions between the contamination and the additives in the drinking water, which can result in the formation of toxins and a greatly reduced effect of the additives. All these factors exert an influence on the animals' well-being; contamination increases the susceptibility to disease and reduces the animals' resistance to those diseases, both of which can have serious consequences for the quality of the animals and the economic results.

Contaminated drinking water:

- Results in changes in the flavour and odour of the water.
- Reduces the uptake of water.
- Results in interactions between the contamination and the additives.
- Reduces the effect of medicines or additives administered in the water.
- Can result in the formation of toxins.
- Increases susceptibility to disease.
- Results in a great deal of unnecessary damage.

BLOCKAGE OF THE DRINK SYSTEM BY BIOFILM



4. Appropriate cleaning

4.1. Requirements imposed on cleaning

Drinking water systems must be cleaned at regular intervals if the contamination of originally clean supplies of drinking water in the stalls is to be avoided. In the absence of regular cleaning the contamination can accumulate to an extent such that the only remedy is to dismantle or replace the entire drinking water system. It will be self-evident that this is a situation which needs to be avoided.

The cleaning of the drinking water system will need to be effective; it will also need to be of a nature such that it involves a minimum possible amount of labour and creates a minimal risk of damage to the equipment. Consequently it will at least be necessary to take account of the area in which the cleaning is to be performed, the material that is to be cleaned, and the nature and severity of the contamination. An additional factor of significance is the biodegradability of the cleaning product; it is important to remember that both the contamination and the cleaning product will ultimately enter the environment.

4.2. What does cleaning entail?

Cleaning or cleansing is understood as the removal of contamination, i.e. freeing the object of undesirable substances.

Unfortunately far from all this contamination is soluble in water; contamination that cannot readily be removed by rinsing of water can be either organic (such as microbes) or inorganic (such as iron) in nature.

Four factors are of importance to the achievement of a good cleaning result, namely the contact time, the temperature, the labour involved (inclusive of the mechanical work required, such as the use of brushes and high-pressure cleaning), and the choice of cleaning product. For a specific cleaning agent the adjustment of one or more of the other factors can reduce, accelerate or improve the cleaning effect achieved with the relevant agent.



The thorough cleaning of a drinking water pipe will remove virtually all of the micro-organisms from the surfaces. Consequently in most instances the subsequent disinfection of the system is not required.

4.3. Requirements imposed on the cleaning agent

An appropriate cleaning agent needs to comply with the following requirements:

- High stability.
- High effectiveness.
- Safe for the materials of construction.
- Safe for the user.
- Safe for the environment.
- Optimal cost-effectiveness



5. Why you should use Intra Hydrocare

Hydrocare:

- Is a biodegradable and strongly-oxidizing cleaning agent.
- Is comprised of a solution of hydrogen peroxide and a silver salt, with additional stabilisation.
- Contains neither organic acids nor toxic or carcinogenic compounds.
- Is less corrosive for humans, animals, and materials.
- Has no environmental impact.
- When used in the appropriate manner does not cause irritation of the skin, respiratory tract, or eyes.
- Has no influence on the odour or flavour of the water.
- Can be used with all types of drinking water systems.
- Is completely water-soluble.
- Does not require a waiting time.
- Is highly effective, even at low concentrations.
- Removes all organic contamination and manganese deposits.
- Has been supported by a great deal of practical and theoretical knowledge for more than 20 years.
- Is recommended by agricultural experts.



6. Hydrocare in comparison with other products



The following table compares Hydrocare with a variety of other cleaning products.

	Hydrocare	Hydrogen peroxide	Peracetic acid	Chlorine	Quats
pH Stability	reasonable	fair	poor	fair	good
Stability after dilution	long	short	fair	short	short
Temperature-sensitivity	almost none	high	high	very high	fair
Effect on biofilm	excellent	fair	excellent	poor	poor
Concentration	low	high	low	high	high
Feasibility of fully-automatic metering	excellent	excellent	not possible	excellent	not possible
Corrosiveness	low	fair	very high	very high	low
Carcinogenicity (promotion of cancer)	no	no	yes, residual products	yes, residual products	no
Influence on flavour	no	no	yes	yes	yes
Influence on odour	no	no	yes	yes	yes
Skin tolerance	good	good	poor	poor	good
Protein breakdown	good	fair	fair	poor	poor
Germicidal effect	excellent	poor	excellent	good	fair
Biodegradability	good	good	good	poor	reasonable

6.1 Hydrocare versus Chlorine

- Hydrocare has been tested and has proved to have:
A very strong cleaning capacity.
- Chlorine has proved to have a high capacity for disinfecting, but does not have the capacity to clean the drinking system.

Products based on chlorine will only eliminate bacteria in the watersystem, but do not remove or dissolve organic pollution from the drinking system. This means that drinking systems treated with chlorine will still contain organic pollution which continues to protect bacteria against the activity of chlorine.

Intersection of a drinking line treated with chlorine	Intersection of a drinking line after cleaning with Hydrocare
<p data-bbox="245 972 571 1043">Bacteria which are still present in the biofilm</p>  <p data-bbox="245 1189 507 1328">Chlorine only eliminates the bacteria which are not protected</p>	<p data-bbox="863 972 1161 1043">A complete clean system</p>  <p data-bbox="863 1200 1118 1328">Water without bacteria or biofilm</p>
<p data-bbox="277 1597 815 1709">Pollution (biofilm) is still present. Bacteria are still present in the biofilm Bacteria will continue to grow and quickly re-contaminate the water</p>	<p data-bbox="874 1597 1410 1709">Pollution (biofilm) is completely removed The breeding ground is dissolved / removed, resulting in no bacteria present. Bacteria do not have any chance to multiply</p>

7. Water quality and norms

Chemical and bacteriological quality good drinking water for animals.

Parameter:	Pigs		Poultry		Comments:
	Good:	Disagree:	Good:	Disagree:	
pH	5-8,5	<4 and >9	5-8,5	<4 and >9	High or low pH levels can cause precipitation of minerals in water lines.
Ammonium (mg/l)	< 1,0	> 2,0	<1,0	>2,0	Can affect bad digestion
Nitrite (mg/l)	<0,10	>1,00	<0,10	>1,00	10 times more toxic than nitrate. Nitrite will form nitrate in the gut.
Nitrate (mg/l)	<100	>200	<100	>200	Performance affected above 100 mg/ml.
Chloride (mg/l)	<250	>2000	<250	>2000	High NaCl may reduce performance and reduce egg shell quality.
Sodium (mg/l)	<400	>800	<100	>200	If sulfate or chloride are high performance will be reduced.
Iron (mg/l)	<0,5	>10,0	<0,5	>5,0	Precipitation clogs water systems.
Manganese (mg/l)	<1,0	>2,0	<0,5	>1,0	Precipitations clogs water systems.
Total hardness (°D)	<20	>25	<15	>20	Less than 10 °D is "soft". More than 20 °D is "hard".
Sulfate (mg/l)	<150	>250	<150	>250	Laxative effect with high magnesium, fast bleeding and edema.
Coliform bacteria (per ml)	<100	>100	<100	>100	0/ml is desirable
Total bacteria (per ml)	<100.000	>100.000	<100.000	>100.000	Advice Intracare < 1000 per ml is acceptable.

Source: Animal Health Service-Deventer-The Netherlands, Oct. 2002.

Important:

With the use of Hydrocare the total amount of bacteria can kept under control of 1.000 bacteria per ml. very easily.

8. Disinfectant effect of Hydrocare

8.1. Bactericidal and fungicidal effects

The bactericidal and fungicidal (moulds) effect of a 1% Hydrocare solution was determined in accordance with the NF T 72-150 procedure. The contact time with the bacteria and moulds suspension was 60 minutes at a temperature of 22°C. The results are shown in the following table.

Strain	Number of micro-organisms/ml	% Hydrocare	Number of micro-organisms/ml
<i>Bacillus cereus</i> (NCTC 7464)	8.4×10^2	1.0	0
<i>Enterococcus faecium</i> (ATCC 8043)	2.9×10^3	1.0	0
<i>Escherichia coli</i> (ATCC 25922)	2.1×10^3	1.0	0
<i>Pseudomonas aeruginosa</i> (ATCC 27853)	1.0×10^3	1.0	0
<i>Staphylococcus aureus</i> (ATCC 25923)	8.0×10^2	1.0	0
<i>Penicillium notatum</i> (ATCC 9179)	3.0×10^3	1.0	0
<i>Proteus mirabilis</i> (NCTC 10975)	3.0×10^3	1.0	0

Conclusion

A 1% Hydrocare solution is fully capable of achieving the required lethality coefficient. Consequently it may be concluded that the 1 – 3% concentration of Hydrocare recommended by Intracare possesses an excellent bactericidal and fungicidal effect on the tested micro-organisms.

8.2. Bactericidal, fungicidal and sporicidal effect

The bactericidal, fungicidal (moulds) and sporicidal effect of a 1% Hydrocare solution was determined in accordance with the NF T 72-190 procedure. The determination was carried out on glass, plastic and steel test surfaces. The contact time was 60 minutes at a temperature of 22°C. The results are shown in the following table.

Strain	Decimal reduction on GLASS	Decimal reduction on PLASTIC	Decimal reduction on STEEL
<i>Pseudomonas aeruginosa</i> (ATCC 27853)	5.2	5.4	6.3
<i>Escherichia coli</i> (ATCC 25922)	5.4	5.6	5.7
<i>Staphylococcus aureus</i> (ATCC 25923)	5.6	5.7	6.1
<i>Enterococcus faecium</i> (ATCC 8043)	5.1	5.0	5.3
<i>Mycobacterium smegmatis</i> (ATCC 15755)	5.0	5.0	5.4
<i>Bacillus subtilis</i> (ATCC 6633)	4.4	3.7	4.7
<i>Bacillus cereus</i> (ATCC 9139)	3.3	3.0	3.6
<i>Clostridium sporogenes</i> (ATCC 11437)	3.2	3.0	3.1
<i>Absidia corymbifera</i> (ATCC 38957)	4.4	4.3	4.7
<i>Cladosporium cladosporioides</i> (ATCC 38906)	4.1	4.1	4.6
<i>Candida albicans</i> (ATCC 38906)	4.5	4.1	4.8
<i>Penicillium verrucosum</i> (ATCC 38905)	4.0	4.3	4.3

Assessment

A bactericidal, fungicidal or sporicidal effect is assigned to a given concentration in combination with a given surface in the event of compliance with the following conditions:

- A bactericidal effect in the event of a decimal reduction of ≥ 5 .
- A sporicidal effect in the event of a decimal reduction of ≥ 3 .
- A fungicidal effect in the event of a decimal reduction of ≥ 4 .

Conclusion

A 1% solution of Intra Hydrocare possesses a bactericidal, fungicidal and sporicidal effect on glass, plastic and steel test surfaces.

9. Use of Hydrocare in the stalls

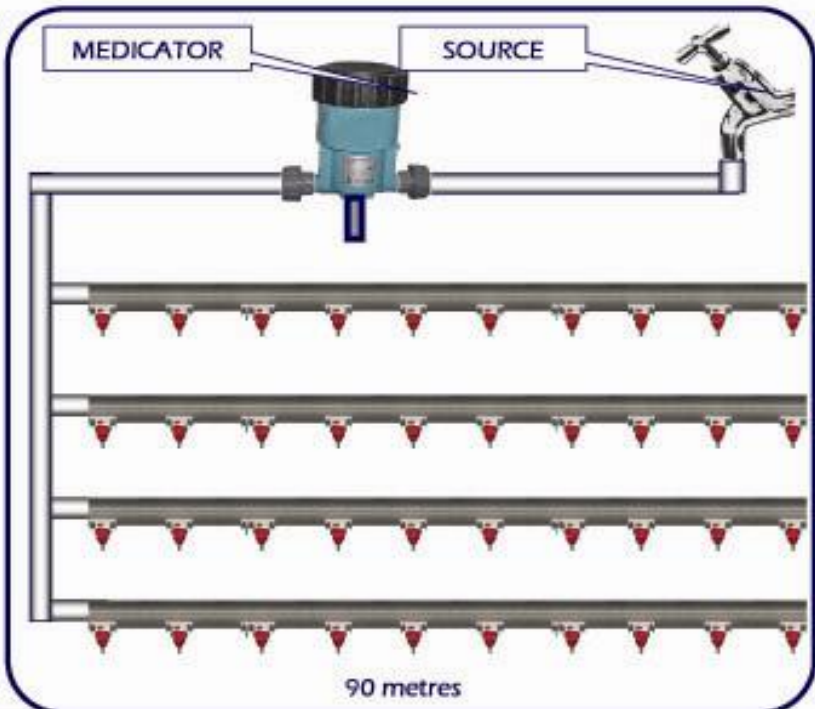
Method for cleaning empty houses

1. Calculate the total length of all drinking water pipes.
For example $4 \times 90 \text{ metres} = 360 \text{ metres}$

CROSS-SECTION OF DRINKSYSTEM

- 1 inch = 0,5 L per metre
- $\frac{3}{4}$ inch = 0,3 L per metre
- $\frac{1}{2}$ inch = 0,125 L per metre

2. Length of drinking water pipes x cross-section, e.g. $\frac{3}{4}$.
= $360 \times 0.3 \text{ litres} = 108 \text{ litres}$
3. Extra 25% ($108 \times 25\%$)
= 27 litres
Total water needed.
= $108 + 27 = 135 \text{ litres}$
4. 135 litres water x 2% Hydrocare = 2.7 litres of Hydrocare



Cleaning when no animals are present:

Systems which will be cleaned must have a good functioning air release when using Hydrocare!

When a reservoir is used:

1. Close the water input of the reservoir.
2. Empty the entire drinking system.
3. Determine the water content of the whole drinking system.
4. Fill the reservoir with as much water as the content of the drinking system plus extra 25%.
5. Add hereafter 2% Hydrocare in the reservoir.
6. Fill the drinking system and open the end of the lines.
7. Wait till you see a fizzing reaction of the liquid on the floor and close the lines directly.
8. Activate all nipples or cups and allowing the cleaning mixture to contact these surfaces as well.
9. Flush the lines after a contact time of 10 hours with clean water.

When a **medicator** is used:

1. Connect the can of Hydrocare with the medicator directly and switch the medicator on the dosage rates of 2%.
2. Fill the drinking system and open the end of the lines.
3. Wait till you see a fizzing reaction of the liquid on the floor and close the lines directly.
4. Activate all nipples or cups and allowing the cleaning mixture to contact these surfaces as well.
5. Flush the lines after a contact time of 10 hours with clean water.

Cleaning when animals are present:

When a **reservoir** is used:

1. Fill the reservoir and close the water input.
2. Add 50 ml of Hydrocare per 1000 litres of water in the reservoir
3. When the reservoir is almost empty repeat this treatment
4. Increase the dosage by 50 mls every two days until the maximum dosage of 250 mls per 1000 litre of water is reached.
5. Depending on the amount and type of contamination, this method will ensure complete cleaning in approximately 10 days.

When a **medicator** is used:

1. Make a mixture of 50 ml Hydrocare and 10 litres of water in a clean and empty bucket.
2. Connect the bucket with the medicator and switch the medicator on the dosage rates of 1%.
3. If the bucket is almost empty repeat this treatment
4. Increase the dosage by 50 mls every two days until the maximum dosage of 250 mls per 10 litre of water is reached.
5. Depending on the amount and type of contamination, this method will ensure complete cleaning in approximately 10 days.

Important:

Sometimes drinking systems can have moulds in it.

In this case you need to be very carefully when treatment take place when animals are present. These moulds may release toxins which can be very harmful to the animals.

It is necessary to destroy all the moulds as soon as possible and hereafter removing all organic compounds must be done.

In order to stop the risks of toxins we start up next schedule:

1. Give a dosage of 250 ml sodiumhypochlorite (15-% active chlorine) per 1000 litres of drinking water for 5 days.
2. Hereafter start up with Hydrocare as described above in schedule: "Cleaning when animals are present".



Preventive treatment:

By simply adding 50-100 mls of Hydrocare per 1000 litres of water after the use of any additive, the intervention can strip away and prevent the bio-film and deposits formation.

Repeat the process as describe in schedule: "Cleaning when animals are present"

The dosages are: 50 till 100 ml Hydrocare per 1000 litres of water for only 24 hours.

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