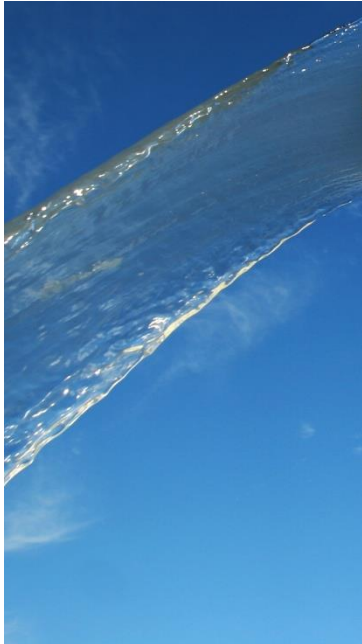


duTRION

Powerful Water Treatment

Our objectives:



- 1. Solve problems of the past**
- 2. Continue with safe & clean water**
- 3. Improve technical results**

Our Statements:

Technical results in the livestock industry also depends on water quality

The quality standard of water for humans and animals *has to* be the same!

“Clean” water is the cheapest input on farms



Your Statements

Water is taken for granted

Problems are related to:

- Feed (quality & factory)
- Veterinarian status
- Use of antibiotic & vaccines
- Low immune system
- Ventilation and equipment
- Employees



ALMOST NEVER RELATED TO DRINKING WATER SYSTEM!!

Where clean water

- **Clean water for crops**



Where clean water

- **Clean water for temp. regulation**
- **Clean water for washing**
- **Clean water for cleaning**



Microbiological Quality



Clean water

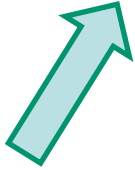


Medication,
vitamines, growth
of microbes

Temperature rises
& minerals
precipitate



Low flow
Dead
circuits
High temp.
Every 10
min. double
bact.



Biofilm



Potable water?



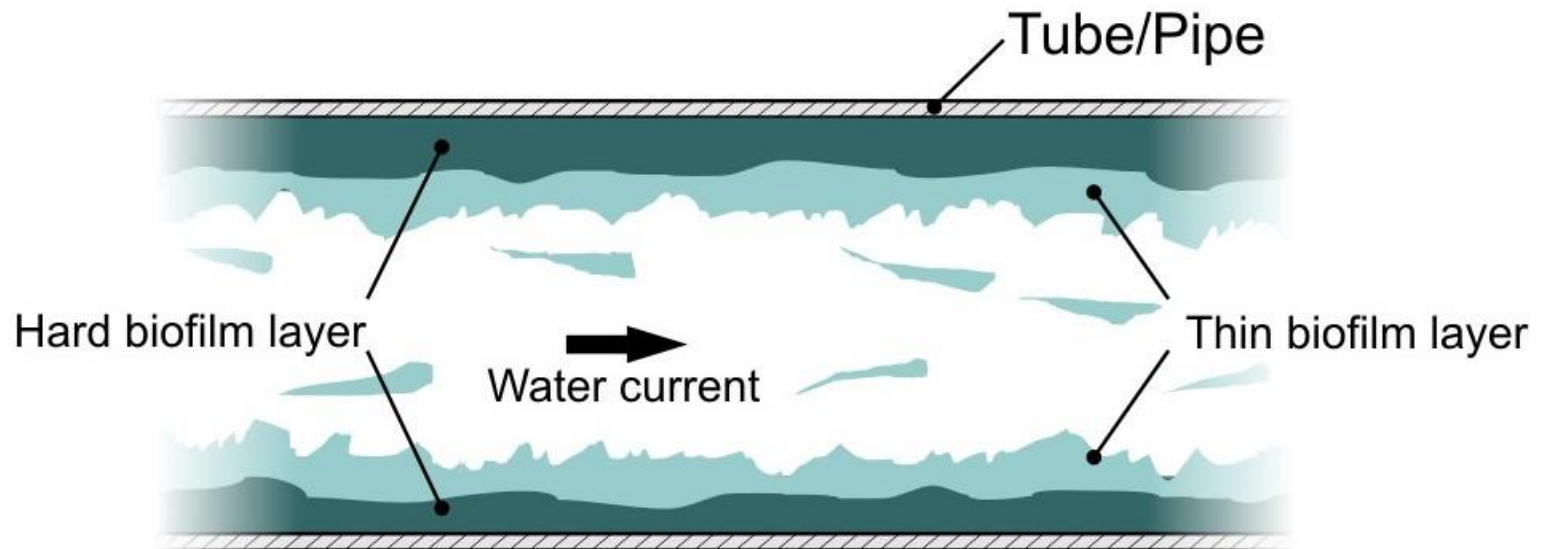
Field examples

- This is what water pipes look like



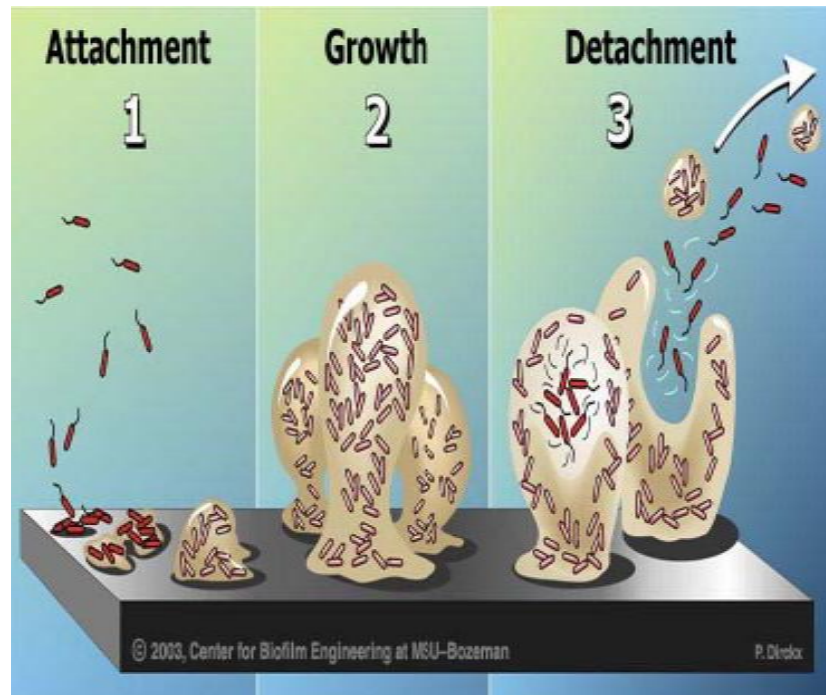
Biofilm

**90% responsible
for microbial water quality problems**

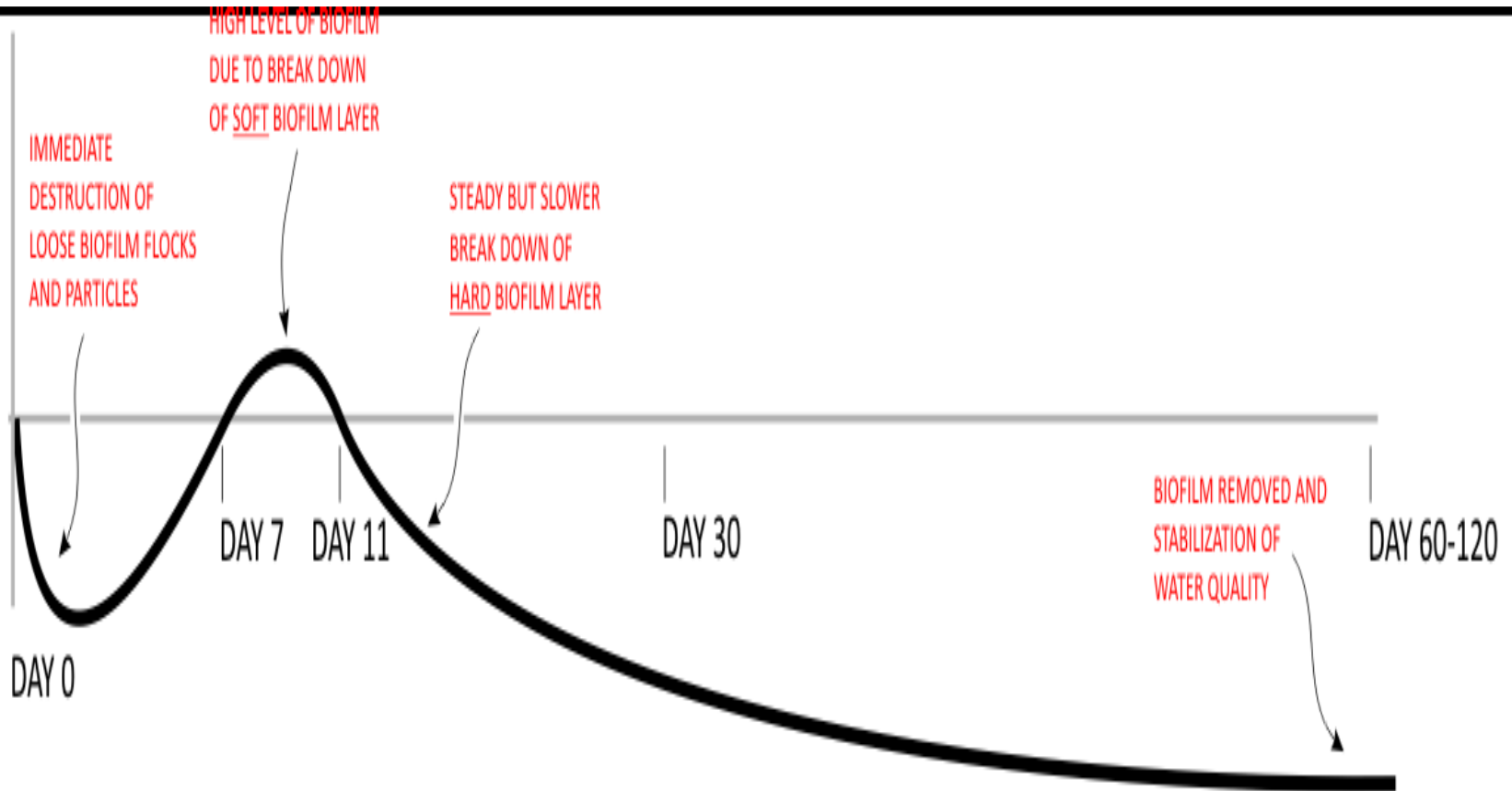


Biofilm

development of biofilms in water lines



What happens in waterlines?



Examples of Aerobic Bacteria Levels

- At the well 2,700 CFU/ml
- End of drinker line in poultry barn 26,600 CFU/ml

- At source (community water line) 203,000 CFU/ml
- End of drinker line in poultry barn 2,340,000 CFU/ml

- At the well 600 CFU/ml
- End of drinker line in poultry barn 280,000 CFU/ml

- At the well 0 CFU/ml
- End of drinker line in poultry barn 4,775,000 CFU/ml

Solutions from the past

- **Filtrations system (mineral based solution)**
- **Magnets, magic boxes, bio solutions**
- **UV light systems**
- **Chemical treatment:**
 - **Chlorine** (Bleach, sodium hypochlorite, chlorine tablets, ...)
 - **Hydrogen peroxide H₂O₂** (in all its existing forms)
 - **Acids pure or blended**
 - **Free chlorine generators**

Or other methods not defined

Effect of chlorine

- **Chlorine does NOT disinfect**
- Chlorine breaks down into “free” chlorine and by-products
- No control of these by-products; are extremely dangerous
- Only “free” chlorine has disinfection power
- Ideal reaction at pH 7,53 !!
 - At lower pH “free” chlorine becomes corrosive
 - At a higher pH less disinfecting capacity
- Does NOT REMOVE BIOFILM
- Does NOT KILL ALL VIRUSES
- Does have RESISTANCE BUILDING
- Overdosing is common practice => TASTE OF WATER AFFECTED
=> THIS LOWERS WATER CONSUMPTION
- “free” chlorine only has a short active live in water

Chlorine is a hazard to human beings and animals

Norm THM
80-100 ppb

“Use of chlorine causes TriHaloMethanes (THM)” e.g. chloroform, bromodichloromethane, dibromochloromethane and bromoform;

Use of chlorine causes haloacetic acids (HAA) e.g. mono-, di, and trichloroacetic acids and mono- and dibromoacetic acids;

“Use of Chlorine causes a tremendous range of mutagenicity in drinking water e.g. Mutagen X (MX)”

MX, THM and HAA are linked to cancer, miscarriages, stillbirths and birth defects;

Mutagen X cancer potency is 170 times greater than chloroform.



The solution for livestock facilities

Pure ClO_2 molecules

- Generator (classic ClO_2)
- Stabilized ClO_2 molecules

Dutrition tablet (each 20 gram)

Dutrition powder



Chlorine molecules:

- **The second most powerful oxidizer known to mankind**
- **Always generated with substances (e.g. chlorine, ClO_2^-) that adversely affects the ClO_2 molecule)**

- **Corrosive and material unfriendly**
- **Gone within 6 hours (Stability)**
- **Explosion Risk**
- **On site generation**
- **Gaseous**
- **Taste/odour problems**
- **Dilution and cooling problems**
- **Risk to personnel**
- **Dosing rate issues**
- **Substantial high level of by-products (e.g. THM's, HAA's) -> undesirable environmental load**



Why Chlorine Dioxide

- pH-range : between 4 and 10 (**compare Chlorine <7**)
- No reaction with hydrochloric acid, so NO "free" chlorine
- No formation of by-products
- Improves taste and odour of potable water
- One molecule which can do **80 different jobs !!!**

Simple production **dutrion**

- **Simple instructions for Tablets**
- **Water volume to be mixed depends on need**
- **Determine right package of **dutrion** tablets**
- **Drop Tablets in water**
- **Short waiting time (depends on temperature)**
- **Stir and ready for application**
- **Use DutriClean dosing unit**
- **Follow simple advise dosing schedule**
- **Check residual**



Disinfecting capacity (waterborn microbes)

Pseudomonas Aeruginosa
Enterobarcter Cloaceae
Proteus Vulgaris

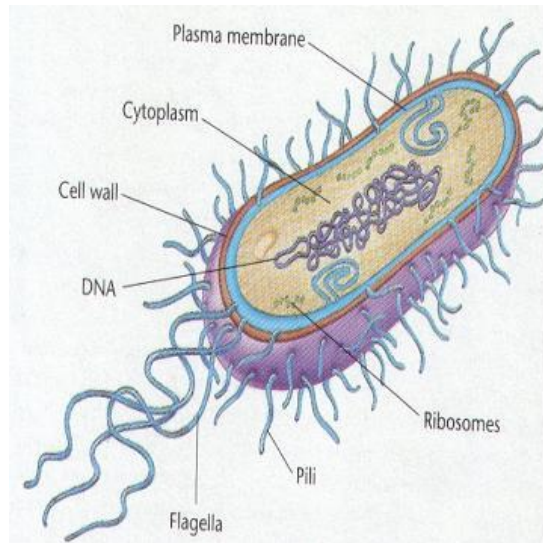
Pseudomona Specie
Enterobarcter Hafnia
Klebsiella Pneumoniae



Salmonella Typhi
Salmonella Gallinarum
Salmonella Choleraesuis
Corynebacterium Nucleatum
Streptococcus Pyrogenes
Mycobacterium Smegmatis
Flavobacterium Species
Clostridium Sporogenus
Clostridium Perfingens
Bacillus Subtilis
Bacillus Megatarium
Bifedibacter Liberium
Aureus
Staphylococcus epidermia
Mycobacteroi Bovis
kansaaii

Salmonella Enteritidis
Salmonella Typhimorium
Salmonella Typhosa
Sarcinae Lutae
Strep 1, 2, 3.
Campylobacter Jejuni
Yersinia Enterolitica
Clostridium Dificile
Fusobacterium Nucleatum
Bacilus Circulans
Bacilus Cereus
Staphylococcus
Streptococcus Faecalis
Mycobacterium

Disinfecting value with CLO2



Aspergillus fumigatus spores	99.9999% kill
Bacillus cereus Spores	99.999% kill
Candida albicans	99.99999% kill
Canine Parvovirus	100% virucidal
Erwinia carotovora carotovara	99.999% kill
Escherica coli	99.9999% kill
Lactobacillus sp.	99.999% kill
Legionella pneumophila	99.999% kill
Listeria monocytogenes	99.9999% kill
Listeria monocytogenes	99.999% kill
15313, Briel, Scott A)	> 6 log kill
Mycobacterium bovis	100% virucidal
Newcastle Disease virus	99.999% kill
Pediococcus sp.	99.999999% kill
Proteus mirabilis	99.999999% kill
Pseudomonas aeruginosa	100% kill
Pseudomonas aeruginosa	100% virucidal
Pseudo rabies virus	99.999% kill
Saccharomyces cerevisiae	100% kill
Salmonella choleraesuis	100% kill
Salmonella choleraesuis	99.999% kill
Salmonella typhimurium	100% kill
Staphylococcus aureus	100% kill
Staphylococcus aureus	99.9999% kill
Staphylococcus aureus	99.99999% kill
Streptococcus faecalis	99.9999% kill
Streptococcus faecium	100.00 kill

Reduce / eliminate risks for:

- **E. coli**
- **Clostridium perfringens**
- **Salmonella**
- **PRRS virus**
- **Streptococcus infections**
- **Staphylococcus infections**
- **Fungal growth**
- **Molds: S. Aureus**
- **Algae growth**
- **Etc... Etc.....**

Conclusion nutrition

- **Revolutionary product!**
- **Proven & Superior water solution**
- **Replacement for all dangerous biocides**
- **More effective than all other classic biocides**
- **Easy and safe to use**
- **Environmental and animal friendly**
- **Positive contribution to health in the food chain**

Questions



- Website
www.dutrion.com
- Brochures available
- Test reports
- Ask our dealers to set up a system
- Thanks for attention
- Enjoy farming