

Alternative solutions to antibiotics



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Best defense against pathogens and troubles is:
the microbiota, an adequate and healthy flora



Promote
immunity

Promote organs
functionality

Promote selective
environmental
conditions



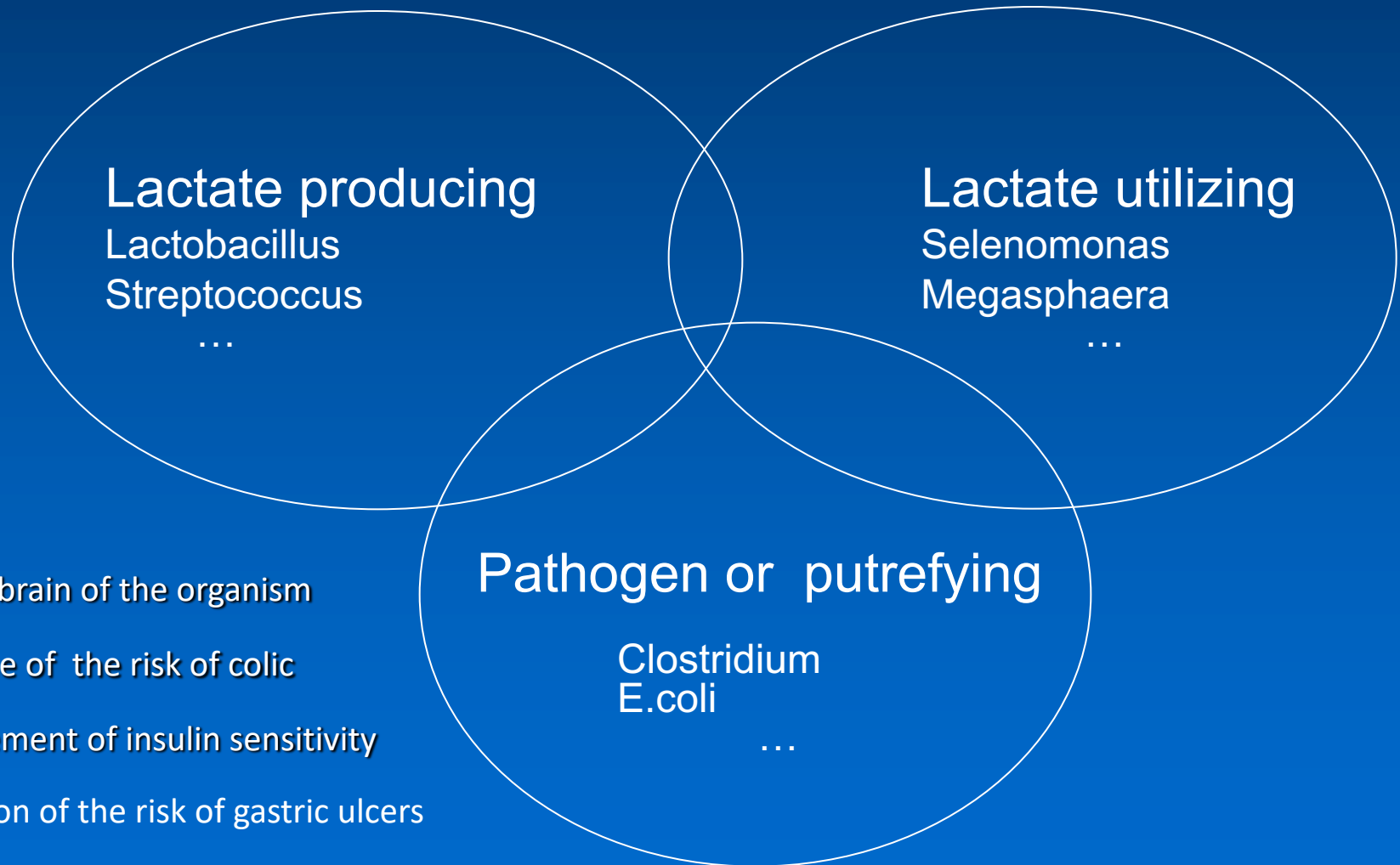
Digestive

Skin

Lung

Genital

Best defense against pathogens and troubles is:
the digestive microbiota, an adequate and healthy flora



Second brain of the organism

Decrease of the risk of colic

Management of insulin sensitivity

Reduction of the risk of gastric ulcers

Management of the production of a good colostrum

Improvement of normal cells development and function

Best defense against pathogens and troubles is:
respiratory microbiota, an adequate and healthy flora

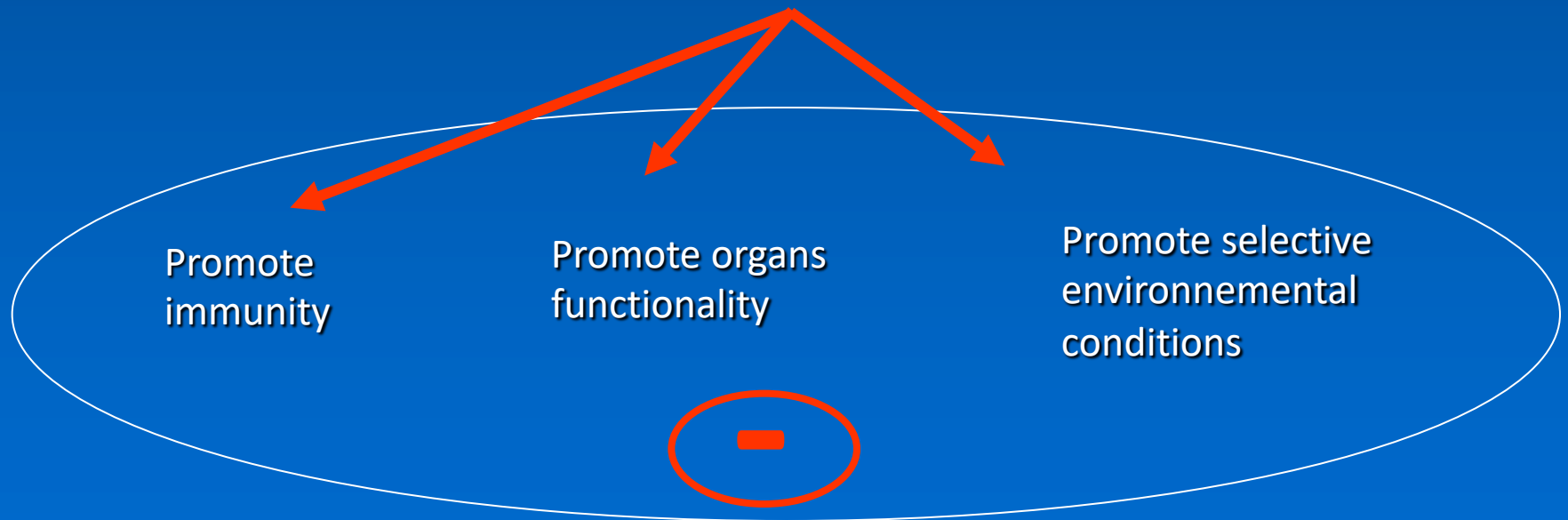
Modulate bronchial reactivity threshold

Prevent hyper sensibility

Act on asthma prevention

Improve normal cells development and function

- AB are less and less available and resistance is more and more observed.
- The first side effect of AB is the impact on the microbiota



Alternative solutions to antibiotics

Phage therapy

Phytotherapy

Ions environmental control

Cu / Ag...

Duox system

Phage therapy

Bacteriophages have been approved by FDA in order to control specific bacteria in food

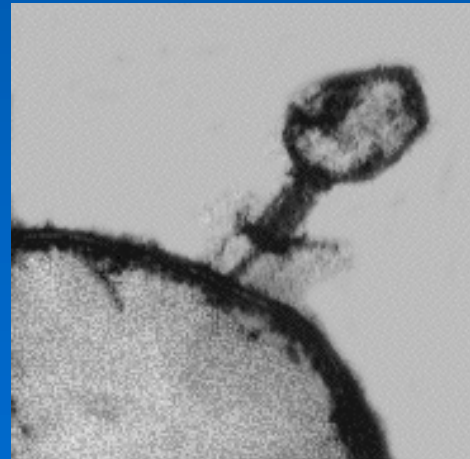
PT improves zootechnical characteristics in poultry and aids to control AEPC

Phage bank are yet established targeting numbers of bacteria

Risk ?

Host immunity?

Control of the sources...



Phyto therapy

- Essential oils
- Plant extracts



~~Bacteria~~
~~virus~~
~~fungi~~

Risk ?

Control of the sources (doping)...

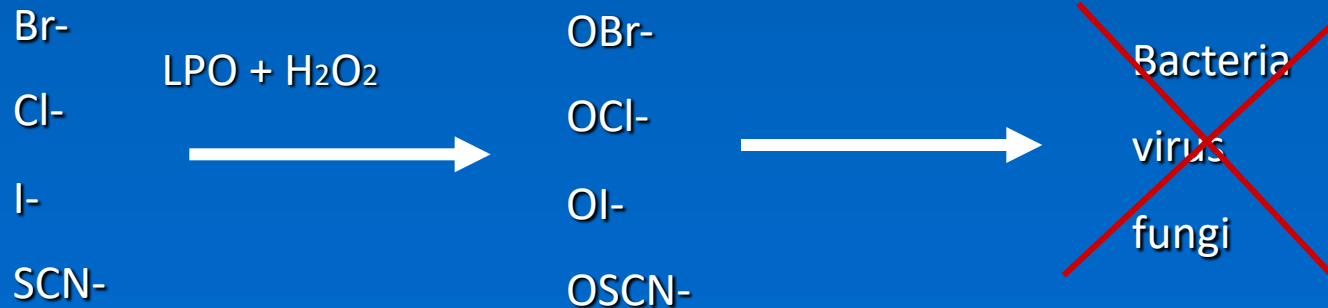
Ions efficacy

Halogen ions are a part of :

- the body response to inflammation
- the non specific immunity

DUOX/LPO/Halide system

Physiologically active in saliva, lung and milk



Ion therapy has now been tested in different conditions and showed effectiveness on several bacteria/ fungi/viruses without any risk of resistance:

E coli		Calve/children	digestive
RSV/adenov		Lamb	lung
Influenza	in-vitro		
Pseudomonas		human	lung
Fusarium	}		
Actinomyce		Dog/ human	periodontal
Schistosomas			
Aspergillus			
Candida	}		
Helicobacter		children	stomach

...

Ion therapy is not only used in animals but also as a very interesting approach of environmental control:

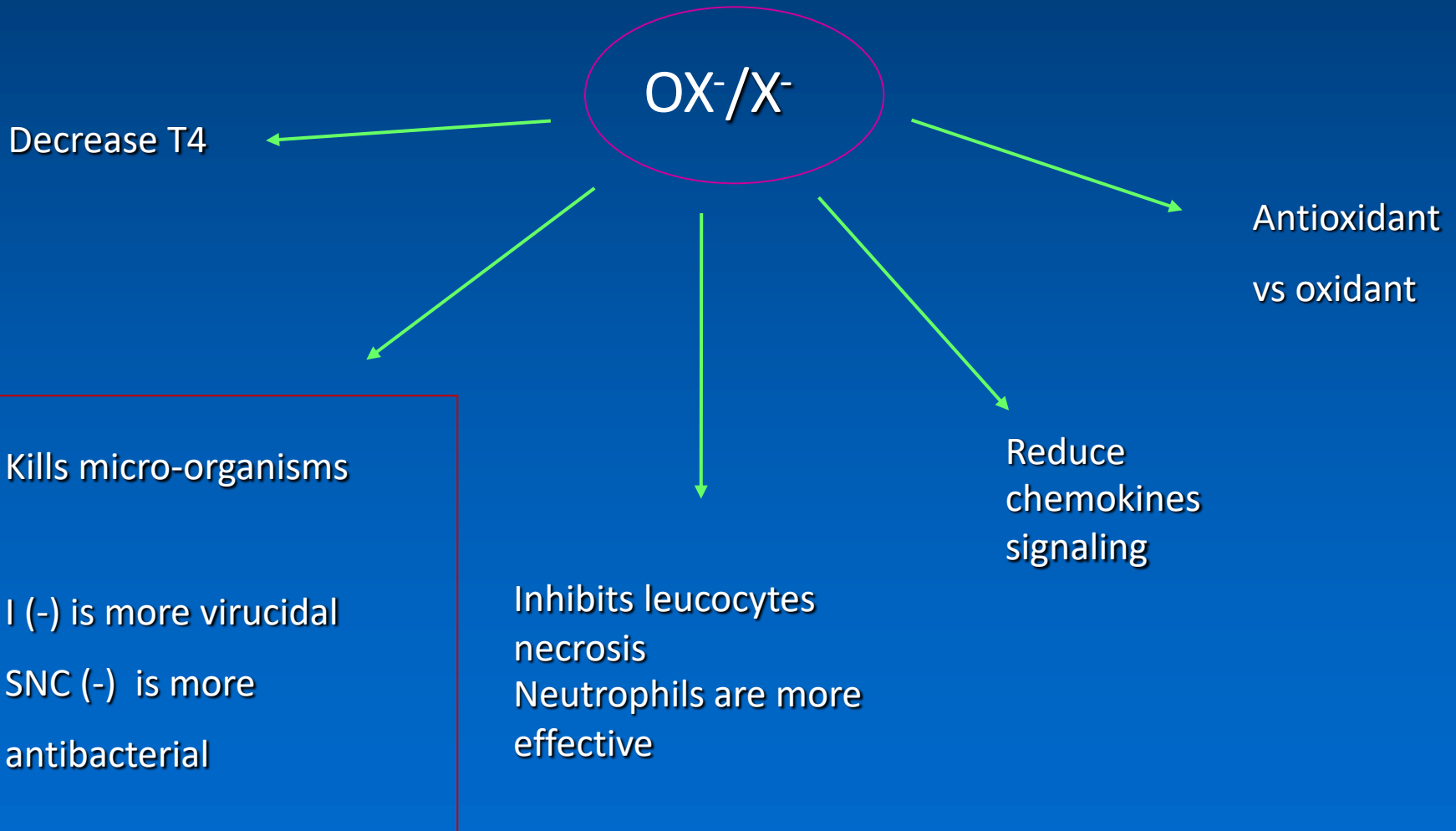
Food preservation

phytotherapeutic agent (Xylella, Iodine, ...)

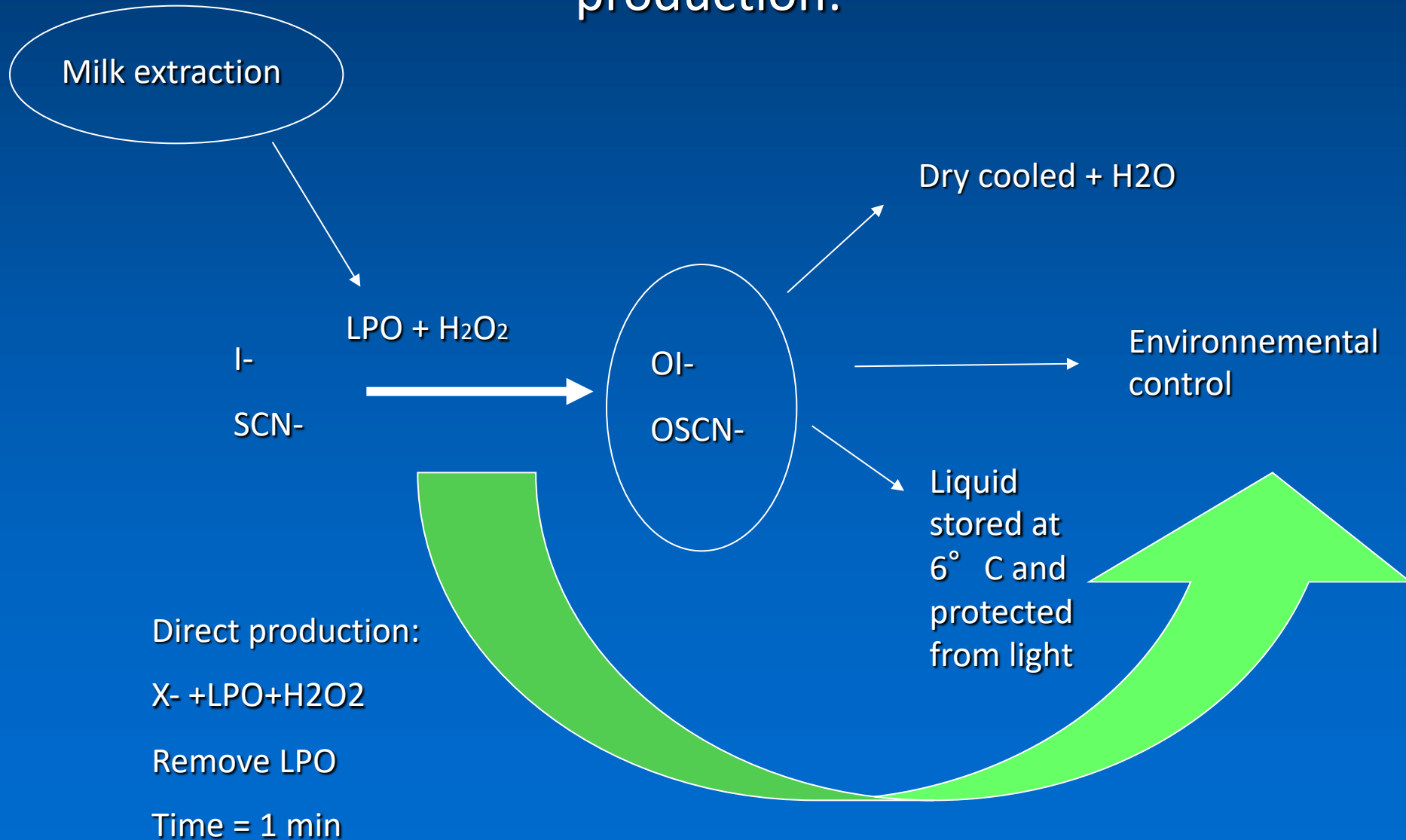
Water sterilization



Ions, focus on physiology:



Ion therapy, focus on X(-) production:



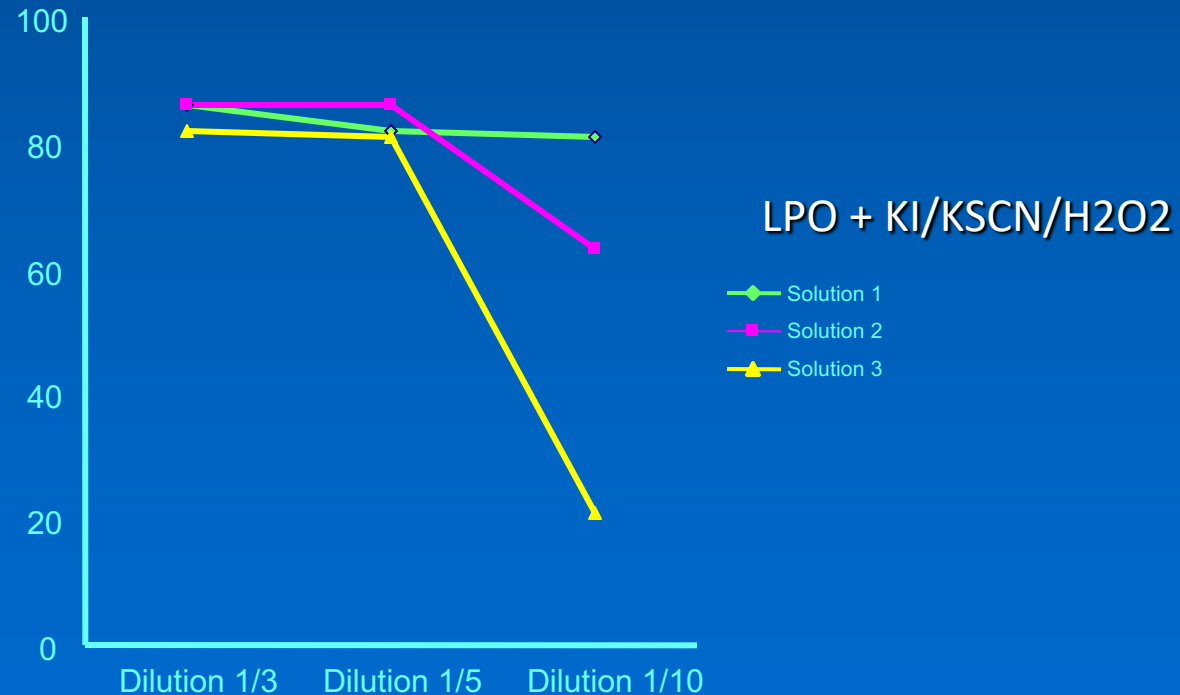
Effect of X(-) on 3 relevant equine bacteria

- **Rhodococcus equi ATCC 25729**
- ***Streptococcus equi subsp equi* ATCC 53185**
- ***Streptococcus equi subsp zooepidemicus* ATCC 43079**

Effect of X(-) on 3 relevant equine bacteria

- *Rhodococcus equi* ATCC 25729 / inhibition measured after culture for 48h / 5min of contact with OX- when bacterial spore reach 10^6 spores/ml (T0)

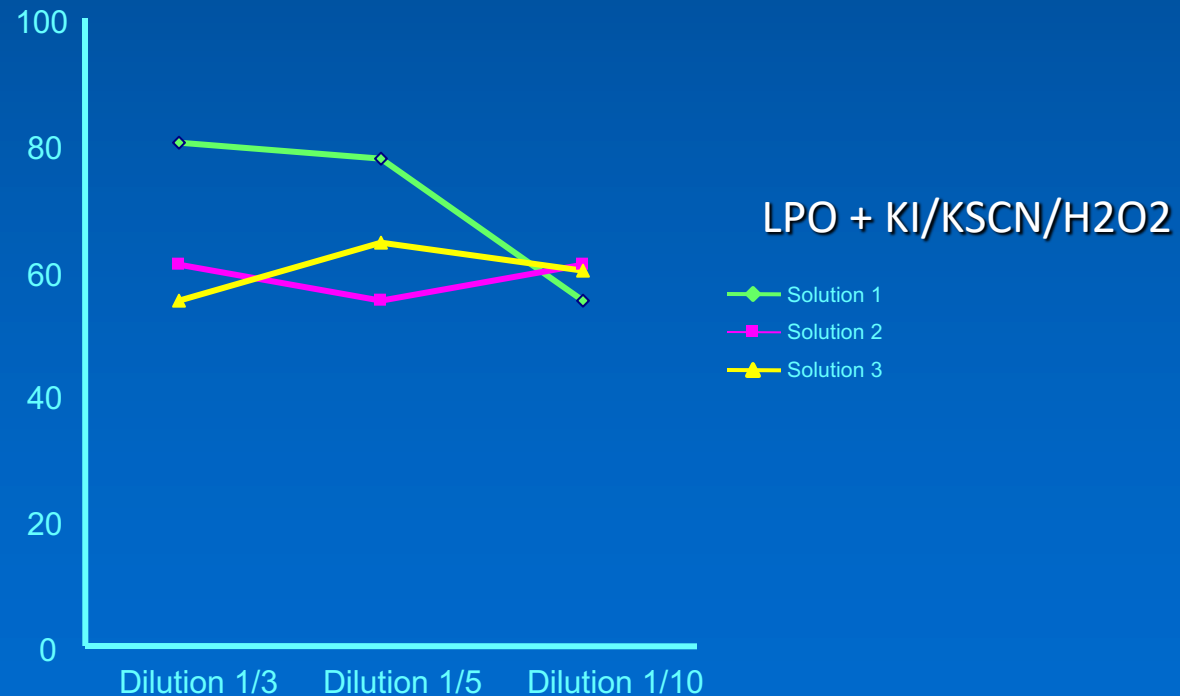
% inhibition



Effect of X(-) on 3 relevant equine bacteria

- *Streptococcus equi subsp equi* ATCC 53185 / inhibition measured after culture for 48h / 5min of contact with OX- when bacterial spore reach 10^6 spores/ml (T0)

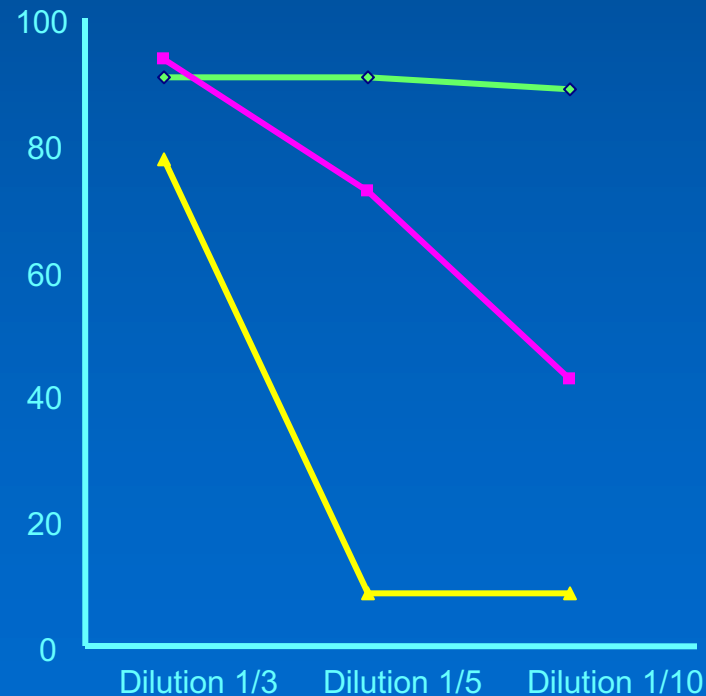
% inhibition



Effect of X(-) on 3 relevant equine bacteria

• *Streptococcus equi subsp zooepidemicus* ATCC 43079 / inhibition measured after culture for 48h / 5min of contact with OX- when bacterial spore reach 10^6 spores/ml (T0)

% inhibition



LPO + KI/KSCN/H₂O₂

—◆— Solution 1
—■— Solution 2
—▲— Solution 3

Ions, focus on toxicity and tolerance test:

Oral administration:

- Is active (KI, KSCN) but with risk of hypothyroidism
- LPO system can be absorbed without risk and will act on digestive system against diarrhea and digestive inflammation.
- X(-) will be active locally and mainly on stomach

Aerosol :

- In the past HS was used to promote self production of X(-) with side effects
- OX(-) can be use in environment or by nebulization without risk

Conclusion

- The use of antibiotics is still the solution to solve specific well diagnosed troubles , under controlled protocols and taking into consideration the resistance and the impact on the microbiota.
- Alternative solution already exist and may be used in practice.
- Ions are available to manage the environment and fight equine pathogens