Laboratoire

COBIOTEX

BACTERIA SAFETY SOLUTION

# WORLD FIRST

First registered bacteria-based biocide

Replaces formalin for biosecurity use

Powder or biofilm

Reduces mastitis

BDC agri

**COBIOTEX** uses good bacteria to combat bad bacteria.

As formalin is gradually banned because of its noxious effects on humans applying it, there is now a bacteria-based alternative to chemical disinfection.

**COBIOTEX** is a French laboratory that has developed combinations of bacteria, based on bacillus and lactobacillus, that aggressively colonise surfaces, outcompeting bacteria such as salmonella, e-coli, streptococcus and staphylococcus.

**COBIOTEX** can be applied in fogging or in powder form, to sanitise livestock buildings before stocking or with livestock present, in a totally safe environment for the animals.

The powder form significantly reduces mastitis when applied to bedding, and the biofilm (fogging) form sanitises buildings prior to stocking, followed by the powder form whilst animals are present.

There are also versions of **COBIOTEX** for treating slurry and manure.

**First bacteria in the world approved as a biocidal substance by the European Commission**

ECHA
EUROPEAN CHEMICALS AGENCY

BIOTECHNOLOGIE FRANCAISE

Cobiotex is available in the UK from BDC agri
www.bdc-agri.com 01206 381521
For further information call Greg Dunn 07801 308054

Dietaxion
co-concevons l'éco-performance

# HYGIENE INGREDIENTS

## Creation of POSITIVE BIOFILMS
## for animal Welfare and Health

DIETAXION adapts the bacteria complexes developed by COBIOTEX, selecting them and combining them for their different applications for use on farm.

These bacteria complexes allow the creation of POSITIVE BIOFILMS.

Beneficial bacteria from these complexes adhere to building surfaces and equipment and multiply, restricting the spread of undesirable bacteria.

**Eco-control of systems by positive bacteria**

**Bio-control**

### COBIOTEX Biofilm
### COBIOTEX 410 Absorbant

usable in Organique Farming

ZOOTECHNICAL BENEFITS

- Biocontrol of commensal bacteria
- Sanitation of floors and bedding for animal welfare
- Decrease in frequency of sanitary problems
- Improvement of zootechnical performance (growth, FCR)

**Effluents**

### COBIOTEX 210 Litière
### COBIOTEX CPF
### COBIOTEX Elit'

usable in Organique Farming

ZOOTECHNICAL BENEFITS

- Improvement of the agronomic value of manure (nitrogen +20%)
- Faster composting process
- Reduction of noctious gas production (-15 to 30%) and reduction in odour
- Reduction of straw use
- Reduction in frequency of manure clearance - means less to dispose of

Laboratoire COBIOTEX
BACTERIA SAFETY SOLUTION

ISO 22000 BUREAU VERITAS Certification

COBIOTEX is a research laboratory recognised by the French Ministry of Research for its expertise in the microbiological evolution in organic materials. It owns the rights to 22 bacteria strains: identified individually (ADN sequence), characterised and registered at the National Collection of the Pasteur Institute in France. COBIOTEX is the owner of the first bacteria-based biocide, BIOCIDE type 3.

**COBIOTEX products are available in the UK from BDC agri (the trading name of Black Diamond Commodities Ltd)**
**Unit 11, West Mersea Business Centre, Rushmere Close, West Mersea, Essex CO5 8QQ**
**01206 381521 sales@blackdiamondcommodities.com www.bdc-agri.com**

# EFFET DE L'UTILISATION D'UN COMPLEXE BACTERIEN MULTISOUCHE SELECTIONNE EN ECLOSOIR SUR LA VIABILITE DES POUSSINS CHAIR (JUSQU'À ABATTAGE)

## *IMPACT OF AN ALTERNATIVE MULTI-STRAIN BACTERIAL COMPLEX IN HATCHERY ON BROILER VIABILITY*

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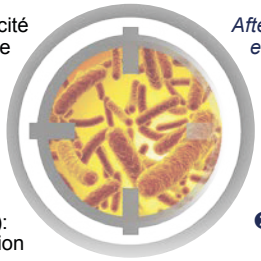
## RESUME /

Après des travaux internes antérieurs démontrant l'efficacité du COBIOTEX Biofilm à substituer le formol, l'objectif de ce travail complémentaire est de comparer l'efficacité de deux technologies alternatives en éclosoir :

❶ un complexe bactérien multi-souches (COBIOTEX Biofilm®): 1 nébulisation post désinfection dans les éclosoirs et sur les œufs.

❷un complexe d'huiles essentielles (HE): 3 évaporations en cours d'éclosion



7 répétitions en éclosoir (20 000 OAC/ éclosoirs) puis le suivi de ces 2x20 lots en production.

Partant d'un statut post désinfection identique dans les deux salles, le complexe bactérien permet :

## *RESUME /*

*After previous internal works which demonstrated the efficiency of COBIOTEX Biofilm to substitute formalin, this complementarian work compares the efficiency of two alternatives technologies to formalin use in setters:*

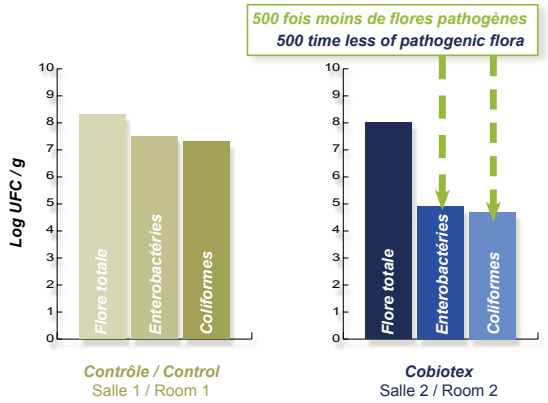
❶ *a nucleus including several selected strains (COBIOTEX Biofilm®): 1 post disinfection spraying in the setters and on the eggs.*

❷ *a complex of essential oils (EO): 3 fumigations during hatching*

*7 repetitions in hatchery rooms (20 000 OAC/setter) and then study of zoo technical performances of those 2x20 flocks in production.*

*Starting from the same post disinfection status in both hatchery rooms, the bacterial complex COBIOTEX allows :*

*Fig. 1*
**STATUT BACTERIOLOGIQUE DES ECLOSOIRS EN FIN D'ECLOSION**




500 fois moins d'Entérobactéries et Coliformes fécaux dans les éclosoirs en fin d'éclosion (p<0,05).

Ce qui semble mener à une contamination foie vitellus inférieure en tendance (E. Coli, Staph, Enterocoques, Pseudomonas, Aspergillus).

*Fig. 1- BACTERIAL COUNTING OF THE SETTERS AT THE END OF HATCHING*

*500 times less Enterobacteria and Fecal Coliforms in the setters at the end of hatching(p<0,05),*

*Which seems to lead to a lower liver-yolk contamination in tendency (E. Coli, Staph, Enterocoques, Pseudomonas, Aspergillus).*

*Fig. 2*
**CONSEQUENCES SUR LES PERFORMANCES ZOOTECHNIQUES**

| | *Essential oils* | *COBIOTEX* | Diff. |
|---|---|---|---|
| Mortalité moyenne à 10 jours<br>*Average mortality at 10 days* | 1.8% | 1.4% | -22% |
| Lots dont la mortalité est > à 1.5%<br>*Batchs with mortality > 1.5%* | 47% | 27% | ↓ |
| Lots dont la mortalité est > à 2%<br>*Batchs with mortality > 2%* | 37% | 18% | ↓ |
| Lots dont la mortalité est > à 2.5%<br>*Batchs with mortality > 2.5%* | 27% | 9% | ↓ |
| Mortalité moyenne à 57 jours<br>*Average mortality at 57 days* | 3,71% | 2.65% | -28% |
| % saisie abattoir<br>*% culling* | 0.51% | 0.42% | -16% |

- **-22% de mortalité sur les 10 premiers jours d'élevage (p<0,05)**
- **Moindre mortalité maintenue jusqu'à abattage (57 jours).**
- **-16% de saisies en abattoir.**

*Fig. 2- CONSEQUENCES ON ZOOTECHNICAL PERFORMANCES*

- **-22% of mortality on the first 10 days of production (p<0,05)**
- **Lower mortality maintained until slaughter age (57 days),**
- **-16% culling rate at slaughter house.**

## CONCLUSIONS /

**L'utilisation d'un noyau bactérien (dont un actif est « Biocide TP3 ») est plus efficace que le traitement huiles essentielles sur le contrôle des populations bactériennes pathogènes en éclosoir.**

**Cette nouvelle approche de prophylaxie constitue donc une alternative intéressante dans la stratégie sanitaire en couvoir chair et la stratégie qualité du poussin de un jour en élevage.**

## *CONCLUSIONS /*

***The use of a selected bacterial nucleus (One of the bacteria is "Biocide TP3") is more efficient than the treatment with essential oils (EO) on the control of pathogenic flora in hatcheries.***

***This new prophylaxis approach represents an efficient alternative in the sanitarian strategy in broiler hatcheries and in the day 1 chick's quality strategy in production.***

*12èmes Journées de la Recherche Avicole et Palmipèdes à Foie Gras*
*05 et 06 avril 2017, Tours (France)*

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# COBIOTEX®112 Biofilm

COBIOTEX

HATCHERY EXPERIMENTAL TRIAL 3 (English)

## BIOSECURITY / PROPHYLAXIS: Maintenance and sanitation of hatching buildings and equipment

## PRINCIPLE

The **COBIOTEX 112 Biofilm** principle is to **control the flora using a bacterial complex in the whole building.** This "positive biofilm" will guide the surrounding microbism and limit the commensal flora (sulfite reducing enterobacteria…) by:

1- a fast colonization of livestock's contact areas
2 - the use of usual nutrients of the commensal flora (nutritive competition)
3 - the production of substances which inhibit the commensal flora

This trial aims to evaluate the effectiveness of this technology in the fight against Enterococci and against all pathogenic flora in comparison with conventional methods (use of formalin).

## DESCRIPTION OF THE PROTOCOL

Trial conducted by DIETAXION in a hatching company in France.
[November, 2013].

Each treatment has been studied on 3 hatcheries:

| |
|---|
| **Group 1 : CONTROL - without treatment during hatching (3 hatchers)** |
| **Group 2 : Treated during hatching with FORMALIN (3 hatchers)** |
| **Group 3 : Treated before hatching with COBIOTEX Biofilm (3 hatchers)** |

**1st step :**
Disinfection and drying of the hatchery then transfer of the eggs of same origin to the hatchers

**2nd step :** Treatment application

**Group 2 :** Free diffusion of volatile formalin in the hatcher (dosage to be specified)

**Group 3 :** Nebulization of 2,5 g of **COBIOTEX Biofilm** for 1000 eggs = 50 g diluted in 1 Litres of unchlorinated water (or neutralized with thiosulfate) / hatcher (19 200 eggs)

**3rd step :** Numeration of total flora (FMAT), total coliforms (Ct), enterococci (ENT), sporulated flora (Sp) and presence of Salmonella

- Swabs collected on hatcher walls: after cleaning/disinfection,
- Swabs collected on hatcher walls: at the end of hatching,
- 2 hatching per week = 2 analysis after cleaning and 2 analysis after hatching



Dietaxion CALCIUM NUTRITION ENVIRONMENT
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# COBIOTEX®112 Biofilm

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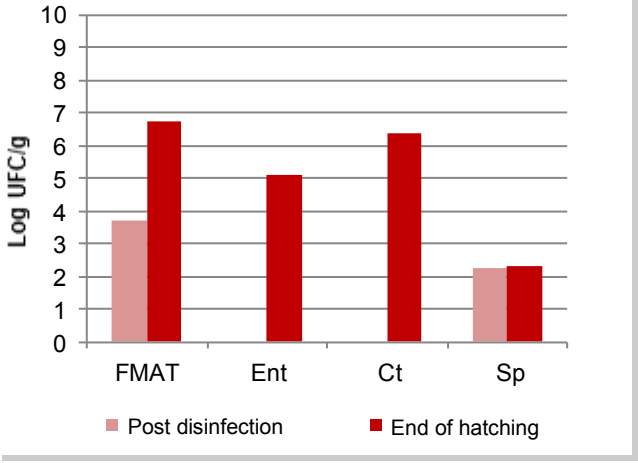
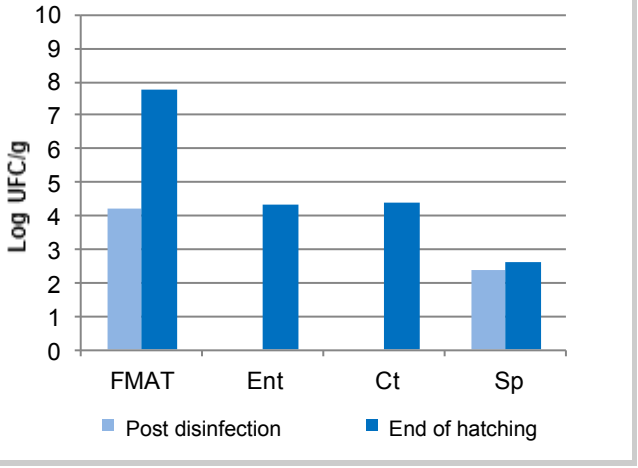
HATCHERY EXPERIMENTAL TRIAL 3 (English)

## RESULTS ANALYSIS

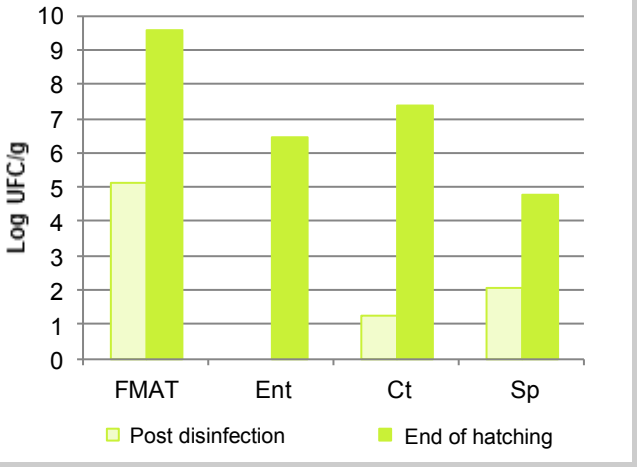
### COUNTING - CONTROL




### COUNTING - FORMALIN




### COUNTING - COBIOTEX BIOFILM




These graphs show that the different groups do not have the same post cleaning-disinfection bacteriological statuses at the beginning of this work (different quality of disinfection):

- Total Flora (FMAT) in the hatchers that will receive COBIOTEX > hatchers formalin > hatchers controls.
- The proportion of total coliforms (Ct) in the FMAT also varies according to the different hatchers.

From this initial difference, it is important to consider that a high total flora does not mean systematically a high pathogenicity.

The monitoring of the proportion of the different pathogens (Total Coliforms (Ct) and enterococci (ENT)) in this total flora is the criterion most efficient to reflect the pathogenic pressure with which the chick will be in contact at birth (hatching).

The study of the proportion of sporulated floras in the total flora allows moreover to illustrate the implantation of the bacteria introduced by COBIOTEX complex.



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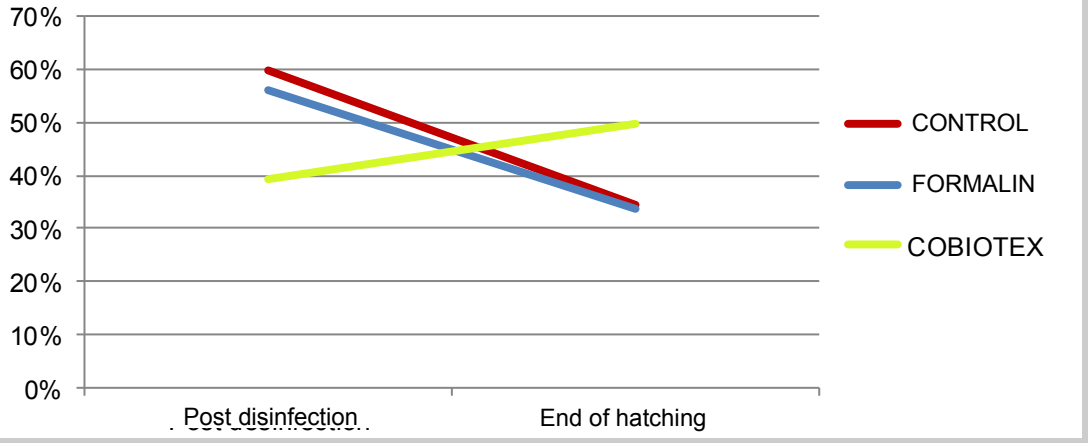
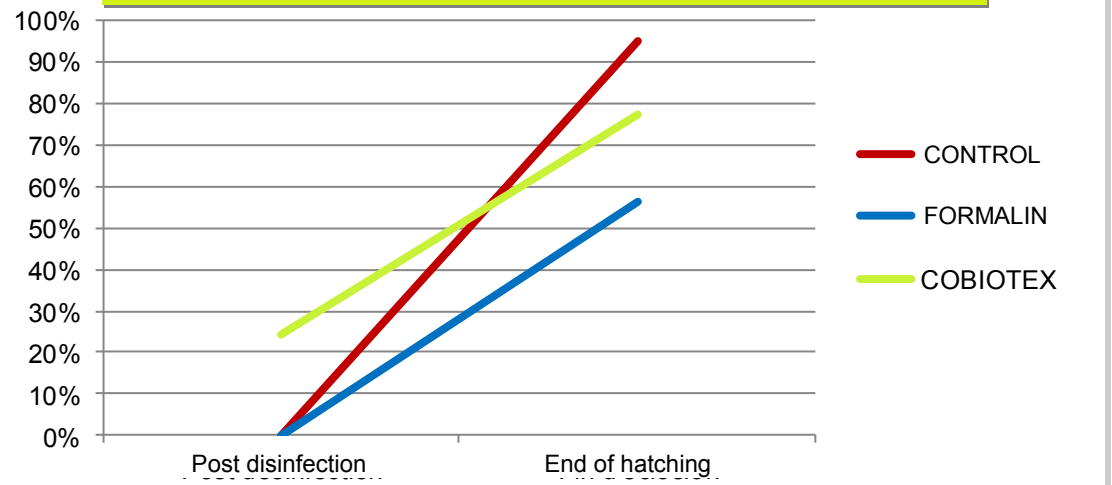
HATCHERY EXPERIMENTAL TRIAL 3 (English)

## EVOLUTION OF SPORULATED FLORA IN TOTAL FLORA



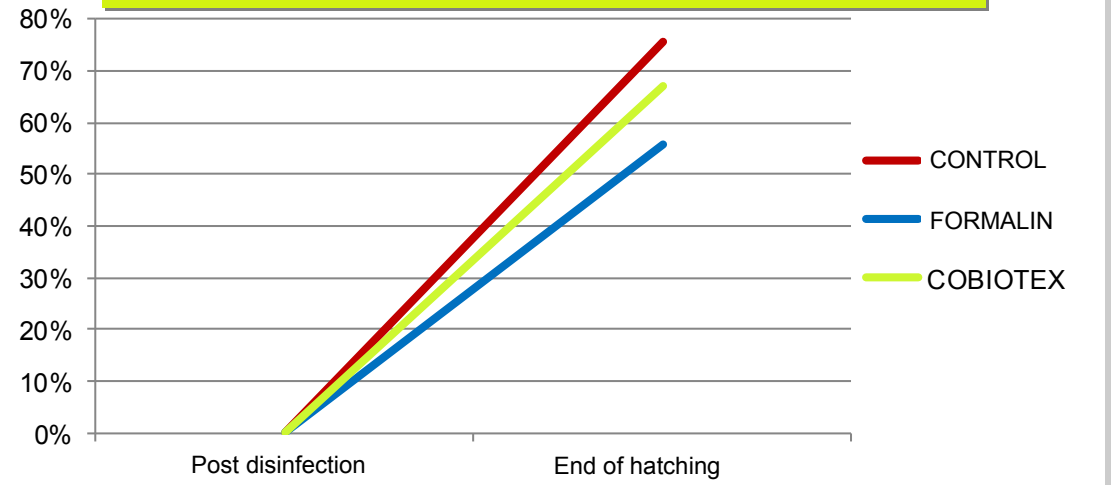

The nebulization of **COBIOTEX Biofilm allows to settle efficiently** in the hatcher and on the eggs **a competitive flora** which develops during hatching period.

## EVOLUTION OF TOTAL COLIFORMS IN TOTAL FLORA




This **COBIOTEX flora inhibits the development of total Coliforms** at least as efficiently as formalin (and even an initial status post disinfection really more contaminated).

## EVOLUTION OF ENTEROCOCCI IN TOTAL FLORA




This **COBIOTEX flora inhibits the development of Enterococci**: this effect remains nevertheless lightly lower than with formalin.



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# COBIOTEX®112 Biofilm



## CONCLUSIONS

The pathogenic flora present in a hatcher is due partly to bacterial residues non-eliminated during cleaning (value varying with the cleaning/disinfection protocols) and secondly to the pathogenic flora conveyed by the eggs.

Considering the advantage that is the smaller danger of the use of COBIOTEX compared with a chemical molecule such as formaldehyde/formalin, this work allow to confirm the efficiency of **COBIOTEX Biofilm** in the sanitarian control of a hatcher via the active inhibition of the pathogenic floras (enterococci and total coliforms).

This study also aimed to evaluate the efficiency of the methods formaldehyde and COBIOTEX against resident salmonellas of the hatchery. No samples detected Salmonella, so it is impossible to conclude on this point.

This work allows us to validate again the hypothesis that the use of **COBIOTEX Biofilm** is an effective technique, close from the formalin efficiency, to control pathogenic bacterial flora in the hatchers.



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The objective of this work:

# To study an alternative bacterial technology to the use of formol in hatchery.

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*c) Réseau Cristal Association, ZAC de la Buzenière, 85505 LES HERBIERS, France*

The use of formol in Gallus hatchery enables keeping mortality (up to 10 days) at a satisfactory level. Since 2006, this technique has been challenged by European regulation, because of the classification of formol as a "chemical carcinogenic and / or mutagen and / or toxic product for breeding" (Schwoerer et al., 2008). This drawback has prompted the search for new alternatives to formol especially in hatcheries.

This work compares formol and a nucleus including several strains of bacteria (Bacillus, Pediococcus...) named **COBIOTEX 112 Biofilm**, (product registered and classified under European legislation as a Biocide).

This study was conducted in two hatcheries:

8 repetitions in two hatchery rooms

(with 12 hatchers) over a period of 4 weeks

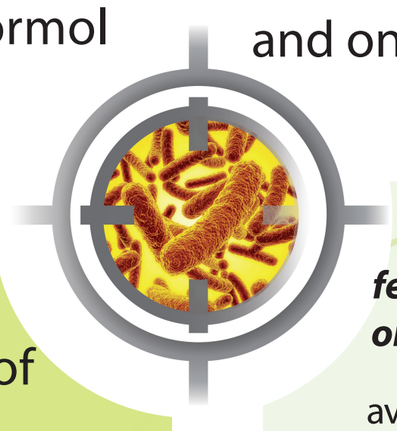
then 7 repetitions in a hatchery room

(with 4 hatchers) over a period of 7 weeks.

After cleaning and disinfection of the hatcheries, to spray with a complex of bacteria, the hatcher room (50 g/room) and the eggs of treated batches (2.5 g / 1000 eggs). The control batches are fumigated with formol the 1st day (1000 ml), the 2nd day (500 ml) and the 3rd day (500 ml) of the hatching period.

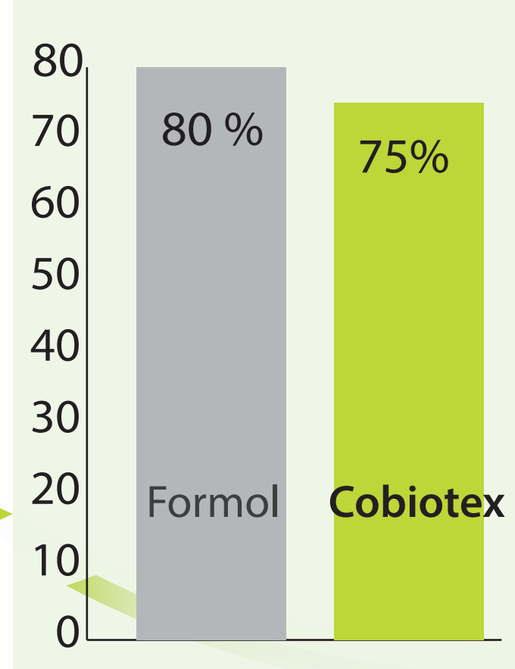
Swabs were taken from the walls and the bottoms of boxes for monitoring the kinetics of bacterial populations between disinfection and end of hatching period. Analysis of liver-yolk of chicks gives information about the quality of the chicks.

On both sites, the bacterial complex allows a stronger reduction of Fecal Coliforms (- 1 log) at the end of hatching on the walls of the hatcher and on the bottom of boxes.



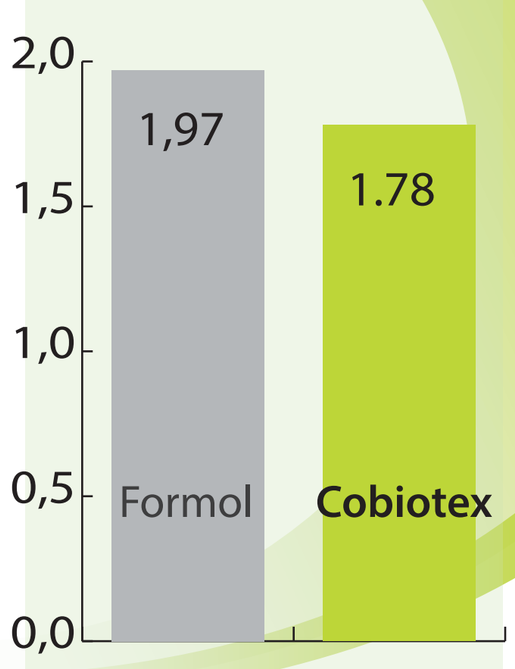
***Level of fecal coliform bacteria on the bottom of boxes***

average in % of TAMF




***Contamination of liver yolk of chicks in non typable Escherichia Coli bacteria***

average in UFC in log/g




Pathogen pressure on chicks is reduced and this results at least in an inferior contamination of liver-yolk on all batches (from 0 to 2 log difference).

The complex of bacteria is at least as efficient as formol in the inhibition of commensal flora (Fecal coliform, Escherichia Coli,...) in hatcheries. It is an efficient alternative to the use of formol in hatcheries.

*Bibliographical reference :*

*Schwoerer et al., AROMSA - Rapport 2008, Substitution du formaldéhyde dans le secteur agricole en pays de la Loire*