

# How positive biofilms can help manage the piglets' microbial environment

In pig farming, a high level of hygiene and biosecurity can significantly improve production costs. The difference in profitability between swine farms with high biosecurity levels and those with lower levels has been estimated at around €200/sow/year.

by Bastien Frayssinet, Technical Deployer, Animal Environment, Lallemand Animal Nutrition.  
www.lallemand-animalnutrition.com

In this context, a new approach based on positive biofilm has shown great potential in maternity and post-weaning phases. Several on-farm trials indicate benefits in both environments.

## The positive biofilm approach

Micro-organisms are ubiquitous in farm environments, with surfaces in buildings and equipment colonised by micro-organisms, often in the form of biofilms. Before a new batch of piglets enters the building, cleaning and disinfection is necessary.

However, the surfaces do not remain sterile and micro-organisms from the animal environment and new animals quickly recolonise, forming biofilms that may include undesired or pathogenic bacteria. To counteract negative biofilms, the positive biofilm concept involves the application of carefully selected

beneficial bacteria along building surfaces and equipment immediately after cleaning and disinfection. This strategy aims to establish a positive biofilm that leaves less space for the development of harmful biofilms.

To develop its positive biofilm solution, Lalfilm Pro, Lallemand Animal Nutrition has selected some bacteria strains for their ability to form a biofilm and rapidly occupy the environment. In vitro testing has shown that of surface coverage within 12 hours (Fig. 1).

The selected bacteria were formulated into a specific adhesive blend that can be sprayed on both vertical and horizontal surfaces.

## Application in piglets

A trial was carried out in piglets during five months with three consecutive batches of 2,318 piglets in total in a commercial farm.

Lalfilm Pro was applied in two rooms and two control rooms. Microbial sampling was performed during the first batch within the animals' surrounding (specific petri dishes left on slates). The application of the positive biofilm generated the formation of a positive microbial environment. Consequently, the development of undesirable bacteria in the animal environment (Streptococci, coliforms) was lower.

As a consequence, the overall piglet mortality rate was lower in the Lalfilm Pro rooms (0.43%) compared to the control rooms (1.46%).

Such trial corroborates the fact that the application of a positive biofilm solution to complement

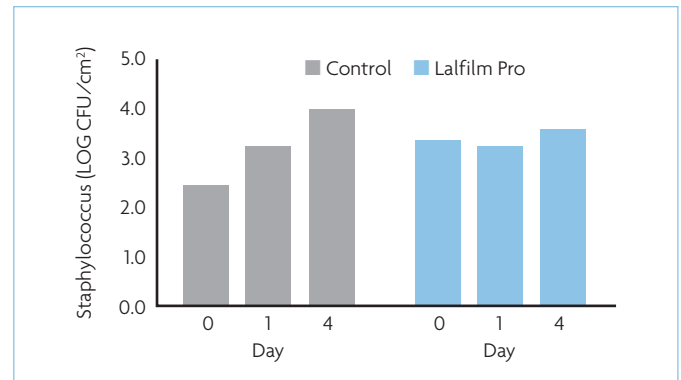


Fig. 2. Evolution of *Staphylococcus* spp. contamination on slatted floors of farrowing room with and without positive biofilm application in LOG CFU/cm². Day 0 corresponds to the entry of the sows.

cleaning and disinfection procedures helps maintain a safe microbial environment before the entry of the piglets.

## Managing the microbiota of the farrowing room

In farrowing rooms, a trial conducted in Italy in a commercial farm shows similar benefits. The positive biofilm Lalfilm Pro was applied on walls and floors of the farrowing room after disinfection and three days prior to sows' entrance. Microbial sampling in the environment was carried out on slatted floors at different time points.

Again, the positive biofilm solution helped to maintain a positive microbial balance in the building:

- *Staphylococcus* spp. were present in both Lalfilm Pro and control

rooms, and on both plastic walls and slatted floors.

In the control room, bacteria count shows an increase over time of *Staphylococcus* spp. and in the Lalfilm Pro room, the speed of growth is almost stabilised from 2.9 to 3.0 log/cm². At day four, *Staphylococcus* spp. population was lower in the Lalfilm Pro room (Fig. 2).

- The development of undesired micro-organisms was lower than in the control room.

● *Streptococcus* spp. was only observed on slatted floor surfaces. Again, the positive biofilm implementation helped keep good hygiene conditions.

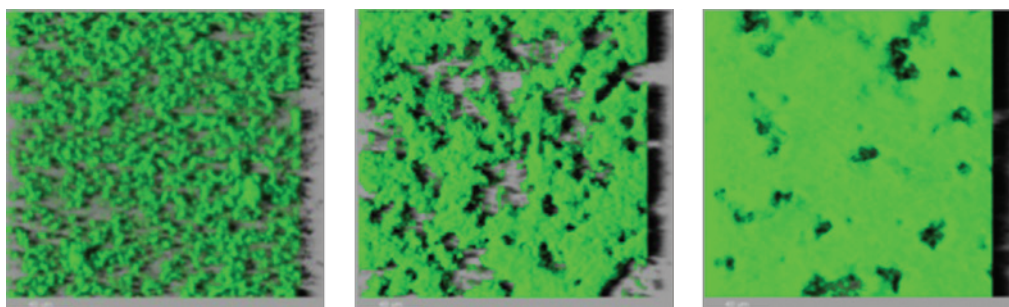
## Conclusion

A new approach to biosecurity management is possible, which includes three main steps:

- Cleaning.
- Disinfection.
- Application of positive biofilm solution.

In today's 'one health' context, ensuring a safe microbial environment during the whole pig production cycle is a must and new approaches to biosecurity that combine disinfection and a virtuous microbial ecosystem management approach are very promising. ■

Fig. 1. Positive surface colonisation by Lalfilm Pro bacteria after 0, 6 and 24 hours.



References are available from the author on request