

**FFoQSI**  
**Austrian Competence Centre for Feed and Food Quality, Safety and Innovation**

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## MAKING INVISIBLE DANGERS VISIBLE - BIOFILMS IN THE FOOD INDUSTRY

BIOFILMS POSE A THREAT TO FOOD SAFETY. FFOQSI EXPLORES THE BASICS FOR TARGETED COUNTER-STRATEGIES.

Everyone is familiar with them at home - stubborn deposits in joints or in places that have not been cleaned for a long time and which are difficult to get rid of. These coatings are often so-called biofilms: Associations of microorganisms that have formed a protective layer around themselves, that enables their inhabitants to survive even under challenging living conditions such as in contact with cleaning agents and disinfectants.

Despite daily disinfection measures in food establishments biofilms can form in places that are difficult to clean.

They are a major problem as they can harbor spoilage organisms and pathogens of food-associated diseases (such as Listeria, EHEC and Salmonella). When food

comes into contact with such biofilms, the shelf life of the product can be significantly shortened or, in the case of pathogens, consumers can become ill from eating contaminated food.

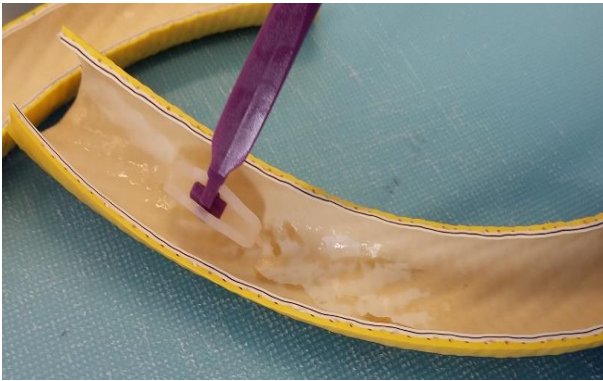
Only targeted measures that combine physical and chemical purification strategies help against stubborn biofilms. Therefore, it is important to eliminate biofilms in the early stages of their development.

This can only be done if we know where they occur and what they are composed of. So far, there is little detailed knowledge about biofilms in the food producing environment.

## SUCCESS STORY

FFoQSI's strategic project "Biofilm Recognition" has two goals: (i) to characterize biofilms from food plants in order to be able to take targeted countermeasures and (ii) to develop a real-time detector that recognizes biofilms before they can be seen with the naked eye.

Biofilms could be isolated from surfaces in contact with food as well as from hidden places such as the inside of water hoses from where bacteria can be flushed onto the freshly purified surfaces during cleaning, which can lead to contamination during the next production unit.



Biofilm in a water hose during laboratory examination  
Photo: Eva M. Wagner

Some of the bacteria found in biofilms are known to promote food spoilage and greatly reduce the shelf life of products. The next step will be to investigate the contribution of pathogens (listeria) to biofilm formation and how they can survive in biofilms.

The real-time detection of biofilms is based on their characteristic chemical fingerprint using optical spectroscopic technologies. The FFoQSI detector is designed to enable even non-specialists after a short training period, to directly, easily and reliably detect biofilms as part of standard cleaning checks. A prototype is currently being tested.

### Impact and Effects

By real-time detection of biofilms at an early stage, the cleaning success can be checked immediately, possible problem areas can be identified promptly and the cleaning concept can be adapted.

In this way, contamination through biofilms in the food environment can be reliably avoided and new anti-biofilm strategies can be developed.

### Project Coordination (Story)

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### Project partners

- Vetmeduni Vienna - University of Veterinary Medicine Vienna, Austria
- RECENDT - Research Center for Non-Destructive Testing GmbH, Austria

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