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PathogenCombat with the full title »Control and prevention of emerging and future pathogens at cellular and molecular level throughout the food chain« is an Integrated Project within the EU 6th Framework Programme. Priority 5; Food Quality & Safety.

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PathogenCombat
for safe food

Control and prevention of emerging and future pathogens at cellular and molecular level throughout the food chain

PathogenCombat

Introduction

Considering food safety, the combat of pathogens is of outmost importance to the consumer. To approach the omnipresent threats from new and emerging pathogens, a new pan-European collaboration, called PathogenCombat, aims at fighting pathogens across the entire food chain.

Combating pathogens to control disease

Despite significant investment, the incidence of food derived disease is still too high in the EU. With the full title »Control and prevention of emerging and future pathogens at cellular and molecular level throughout the food chain« – PathogenCombat attacks this pan-European problem to reduce the incidence of food borne disease.

Besides being of fundamental importance to the consumer, fighting pathogens is also of imperative significance to the food industry and economy, as impact on trade and competitiveness is substantial.

Readiness through range of platforms

A range of advanced platforms are being developed to investigate the survival of pathogens. The platforms, of which several are used for the first time in food safety studies, comprise bio imaging, laser tweezers, phage display/convergent evolution, models of functional mammalian cells, functional genomics and array technology.

With the platforms in operation, it is the scope of the project to implement developed platforms and results obtained, within the food industry, to prevent food borne diseases of microbial origin.

Targeting new and emerging pathogens

The versatile profile of pathogens has been selected to provide readiness to control the unknown pathogen. For example, new and emerging pathogens will be targeted for milk and dairy products, together with meat products of ruminants, poultry and pigs.

This folder will give an outline of the different topics and pathogens to be scrutinized within the PathogenCombat project. A pan-European alliance to fight food borne pathogens has begun.

The project is founded on eight pathogens:

2 Gram-positive bacteria: *Listeria monocytogenes* and *Mycobacterium avium* subsp. *paratuberculosis*

2 Gram-negative bacteria: *Campylobacter jejuni* and shiga-like toxin producing *Escherichia coli* (STEC)

1 yeast: Invasive variants of *Saccharomyces cerevisiae*

1 ochratoxin A producing filamentous fungus (*Penicillium nordicum*)

2 viruses: hepatitis E virus (HEV) and tickborne encephalitis virus (TBEV).

Prediction and detection of *Staphylococcus aureus* enterotoxins are also included.

Objectives

Achievements

The overall objective of PathogenCombat is to provide new essential information and methods to the food industry and public authorities on how to reduce the prevalence of new and emerging food borne pathogens.

Specific objectives

Increase knowledge on the factors in the food chain, which enable the viability, persistence and virulence of pathogens.

Improve the detection methods and prediction of the occurrence and virulence of pathogens in the food chain and at time of consumption with molecular biology based culture independent techniques and microarrays.

Development of functional cell models to replace experimental animals.

To develop new processing technologies and systems, new hygienic design, protective and probiotic cultures and new information on host-pathogen interaction to prevent pathogen transmission along the food chain.

Development of support measures to food industries for the uptake of knowledge and tools produced by the project.

Development of new mathematical models for pathogen control throughout the food chain and at time of consumption.

To develop a food safety management system preventing microbial food borne diseases.

Implementation of new and improved communication strategies for consumers, food industry and regulatory agencies.

Expected achievements

New approach to estimate the presence of virulent pathogens up to the time of consumption.

New methods to control the viability and virulence of pathogens throughout the food chain.

New methods for estimation of host-pathogen interaction based upon functional cell models.

Novel processing technologies to inactivate pathogens. New probiotic and protective cultures to eliminate pathogens. Elimination of biofilms based upon hygienic design.

Established strategies and actions for disseminating project deliverables for food SMEs (small or medium size enterprise).

New mathematical models covering food at time of consumption.

New cost effective management systems.

Improved awareness of food safety for the European consumers, food industries and regulatory agencies.

Along with realisation of achievements, they will be implemented in the food industry, in particular the SMEs to produce safe food and improve the health and well being of the European citizens and the competitiveness of the food industry.