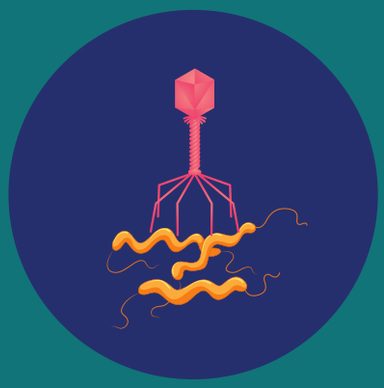
EIT Food is supported by the EIT
a body of the European Union



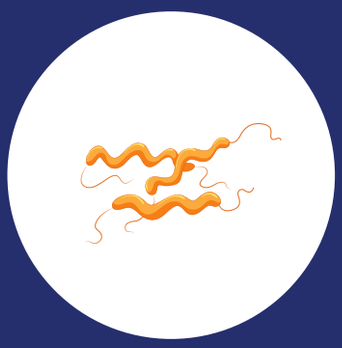
C-SNIPER:

BACTERIOPHAGES AGAINST CAMPYLOBACTER

CAMPYLOBACTERIOSIS - what is it?

The most common foodborne disease in Europe

Recognized in 200 thousand Europeans, with around 9 million cases estimated each year



It is caused by *Campylobacter* bacteria, which are harmless to animals, but very dangerous to humans

The digestive tract of birds and mammals, including farm animals, is a reservoir for *Campylobacter* bacteria

The main carrier of *Campylobacter* bacteria is POULTRY

Losses caused by Campylobacter bacteria in the EU amount to € 2.4 billion per year

CAMPYLOBACTERIOSIS - symptoms

Acute gastroenteritis, which is manifested by:

fever

weakness, nausea

abdominal cramps and inflammation of the intestine with diarrhea

CAMPYLOBACTERIOSIS - ROUTES OF INFECTION

Direct

contact with farm animals

Indirect

consumption of raw or undercooked meat

contact
with pets

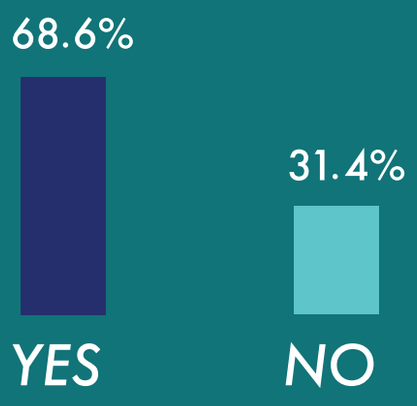
consumption
of contaminated milk
or water

1/4 of all cases are cross-contamination,
especially in households in which raw poultry
is not dealt with properly

THE CONSUMER PARADOX

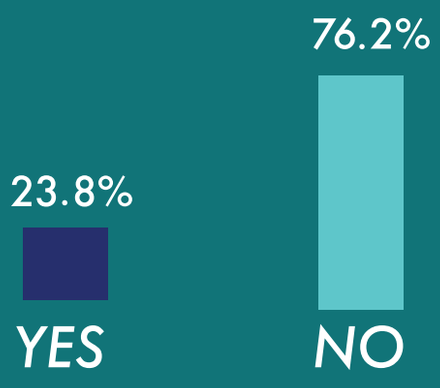
Consumer behaviour was the subject of surveys in 4 EU countries - Germany, Italy, Poland and Spain

Did you know that you are spreading bacteria in your kitchen by handlingraw chicken incorrectly?



(C-SNIPER study, 2019)

Do you have a separate chopping board for cutting raw meat in your kitchen?



(C-SNIPER study, 2019)

CAMPYLOBACTERIOSIS - prophylaxis

Leave raw meat preparation tothe end - start with fruits, vegetables and other food products

Do not wash and rinse raw meat before cooking in order to prevent bacteria from being transferred to the sink, sponge or kitchen counter

Use separate knives, chopping boards, and containers when dealing with raw meat

Thoroughly wash your hands, chopping boards and plates after dealing with raw meat

Use a special thermometer to make sure that the meat being cooked/baked has a minimum temperature of 73 °C

Put raw meat in the fridge right after you get it, and store it away from other food

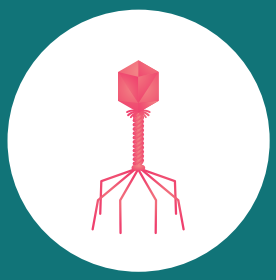
FIGHTING *CAMPYLOBACTER* BACTERIA

IN THE PAST

In order to reduce the presence of pathogens, including Campylobacter bacteria, currently banned ANTIBOTICS were widely used in poultry:

- SIDE EFFECT - Antibiotic resistance that causes 25,000 deaths a year in the EU alone
- In the WHO assessment, antibiotic resistance should be recognized as a global threat to health

NOW



One of the strategies is BACTERIOPHAGES

- ubiquitous viruses that attack and kill bacteria
- naturally occur in nature, and also in wild and farm birds
- narrowly specialized - they only attack specific groups of bacteria

The acceptability of the use of bacteriophages was the subject of surveys in 4 EU countries - Germany, Italy, Poland and Spain

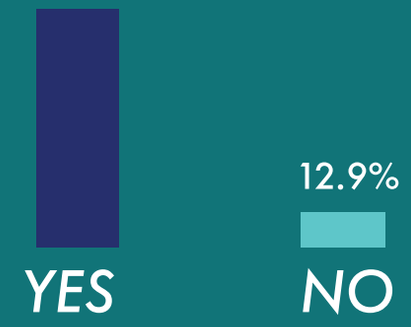
Do you consider the use of bacteriophages in food production acceptable?

Consumers

87.1%

Producers

90%



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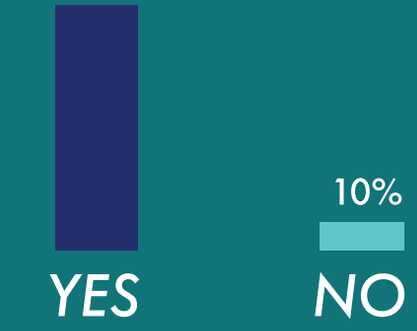


(C-SNIPER study, 2019)

C-SNIPER

As part of the C-SNIPER project of the European Institute of Innovation and Technology in the area of food - EIT Food, 5 European partners:

AZTI
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

Institute of Animal Reproduction and Food Research
Polish Academy of Sciences in Olsztyn

UNIVERSITÀ DEGLI STUDI DI TORINO

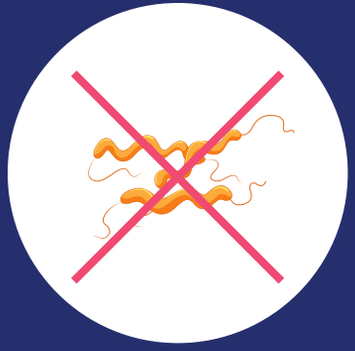
PTC PHAGE TECHNOLOGY CENTER

ORA AGRICOLA

develop and test a bacteriophage-based strategy to prevent the contamination of poultry meat by *Campylobacter* bacteria.

WHAT ARE OUR GOALS?

increase food safety in a way that is sustainable for humans and the environment



reduce Campylobacteriosis and economic losses through the use of natural killers of *Campylobacter* bacteria

WHAT HAVE WE DONE?

1. We characterized *Campylobacter* bacteria that can be found in Spain, Italy and Poland - 3 out of 4 largest poultry producers in the EU
2. We chose bacteriophages that fight *Campylobacter* bacteria in laboratory conditions
3. We examined the acceptability of the use of bacteriophages in food production by consumers and poultry producers
4. We demonstrated the activity of bacteriophages in the digestive tract of chickens

WHAT'S AHEAD?

tests confirming the effectiveness of the solution in combating *Campylobacter* bacteria in the production of poultry meat

preparation of a business plan for the development of the solution and its implementationin the European and global market

This activity has received funding from EIT Food, the innovation community on Food of the European Institute of Innovation and Technology (EIT), a body of the EU, under the Horizon 2020, the EU Framework Programme for Research and Innovation