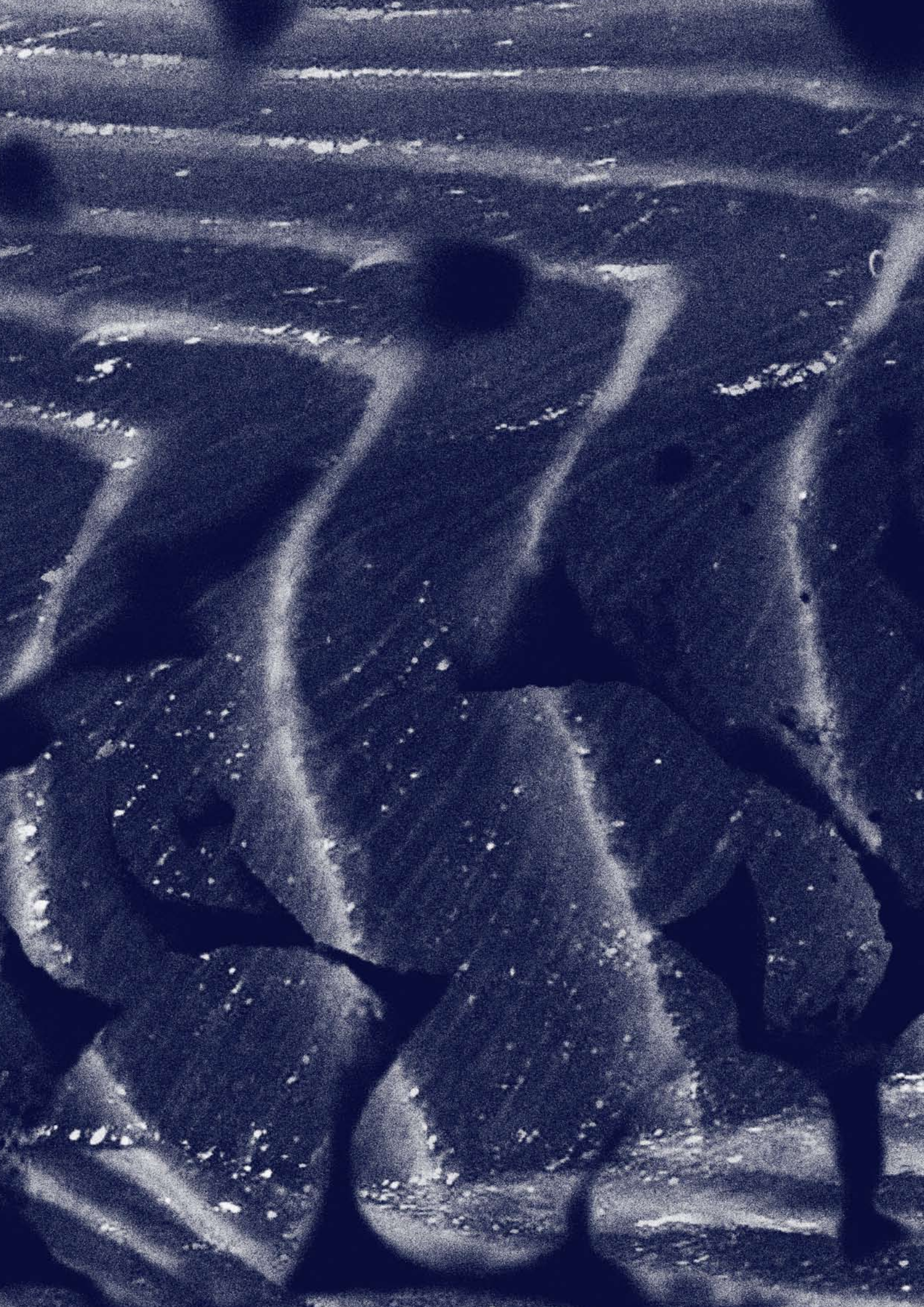


EBI FOOD SAFETY



**BACTERIOPHAGES:
NATURE'S SOLUTION FOR CONTROLLING FOOD PATHOGENS**

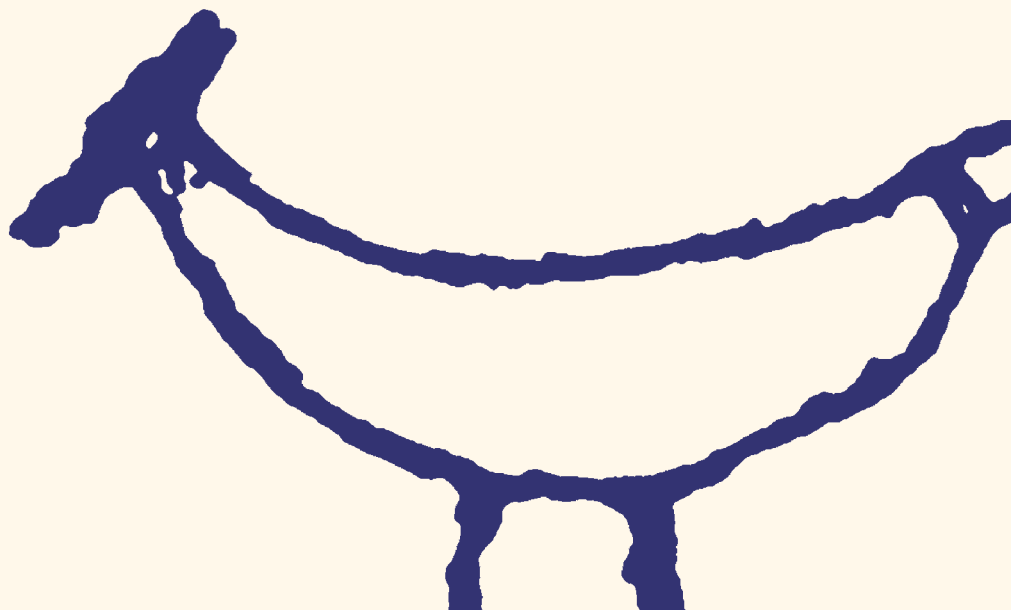
EBI Food Safety develops natural anti-bacterial food safety solutions, based on its bacteriophage technology. The company is located in Wageningen 'Food Valley', The Netherlands. EBI Food Safety is viewed as product leader in the field of applied bacteriophage technology for food products. LISTEX™, the company's product against *Listeria*, is a culture of safe and natural bacteriophages, characterized by its broad spectrum toward *Listeria monocytogenes* strains. It is used as a processing aid in the production of meat, cheese, fish and other products. LISTEX™ P100 is the first bacteriophage product which has been recognised by the US FDA as GRAS (Generally Recognised as Safe). EBI Food Safety is committed to making the application of bacteriophages a new industry standard for the control of unwanted pathogens in food products.

For more information, visit www.ebifoodsafety.com.



**FIE EUROPE AWARDS EBI FOOD SAFETY'S LISTEX™
AS THE BEST INNOVATION IN FOOD INGREDIENTS 2007**

In London, at the world's largest food ingredient event, the FIE Gold Award "The Best Innovation in Food Ingredients 2007" was awarded to EBI Food Safety's LISTEX™. The awards are the traditional "Oscars" of the food industry, and are recognized as the most important honor in the food ingredients industry. The award is a confirmation from the industry that the use of phages against unwanted pathogens is expected to become an industry standard.



FOOD CONTAMINATION

Bacteria cause serious infections and substantial economic disruption in industrialized as well as developing countries. The incidence of infection and contamination is escalating worldwide. Increased travel, intensive farming techniques and extended product shelf life have contributed to the spread of bacteria, and the over-use of conventional antibiotics has hastened the development of resistant bacterial strains. Bacteriophages (Greek for 'bacteria eaters', and often simply called 'phages') are the natural enemy of bacteria, and can provide the logical answer to unwanted pathogens, such as *Listeria*, *Salmonella*, E-coli O157 and *Campylobacter*.

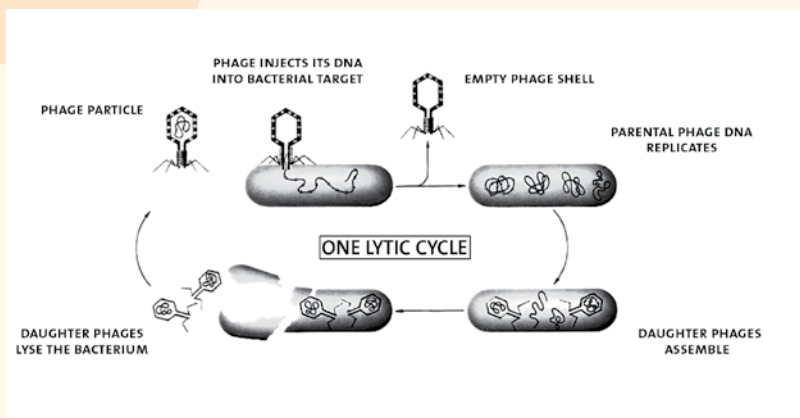
BACTERIOPHAGE TECHNOLOGY...WHAT IS GOOD COMES NATURALLY

Sometimes the answer to a problem is so obvious, one doesn't recognize it, even when it's staring one straight in the face. This is the case with the use of phages against pathogenic bacteria.

- Phages are the most abundant micro-organisms in our environment and are present in high numbers in water and foods of various origins (on fresh and processed food products, more than 100 million viable phages per gram are often present). High numbers of phages are routinely consumed with our food.
- Phages are harmless to humans, animals and plants. Each day humans are exposed to bacteriophages at high levels through food and water, without adverse effect.
- Phages are composed of proteins and nucleic acids, their eventual breakdown products consist exclusively of amino acids and nucleic acids. Thus, they are not 'xenobiotics' and do not leave an ecological footprint.
- Phages do not affect the organoleptics of food (taste, structure, smell, color, etc.).
- Phages infect and kill only bacteria, and in addition are highly 'host-specific': they kill only their 'own' type of bacterium and do not cross species or genus boundaries (i.e. a *Listeria* phage does not recognize a *Salmonella* bacterium, nor does it affect any desired bacteria, e.g. starter cultures, or commensals in the human gastrointestinal tract, or any accompanying bacterial flora in the environment, etc.).

HOW PHAGES WORK

Phages use bacteria for their multiplication, and contribute to environmental 'homeostasis', the situation wherein none of the bacterial species in a biosphere becomes dominant. Every species of bacteria is thought to be the host for at least one phage type. Several phages exist that are able to recognize and lyse (kill) a number of different bacterial strains within one species; these have a 'broad spectrum' or a wide host range. When a phage encounters its specific target bacterium, it attaches itself to the cell wall, penetrates it and destroys the bacterium's ability to function or replicate. The replication of phages weakens the cell wall structure. The cell then lyses and new phages are released into the environment. In the absence of target bacteria, the phages break down into common biological particles that are naturally absorbed back into the environment



FOOD SAFETY ADDS TO PROFITABILITY

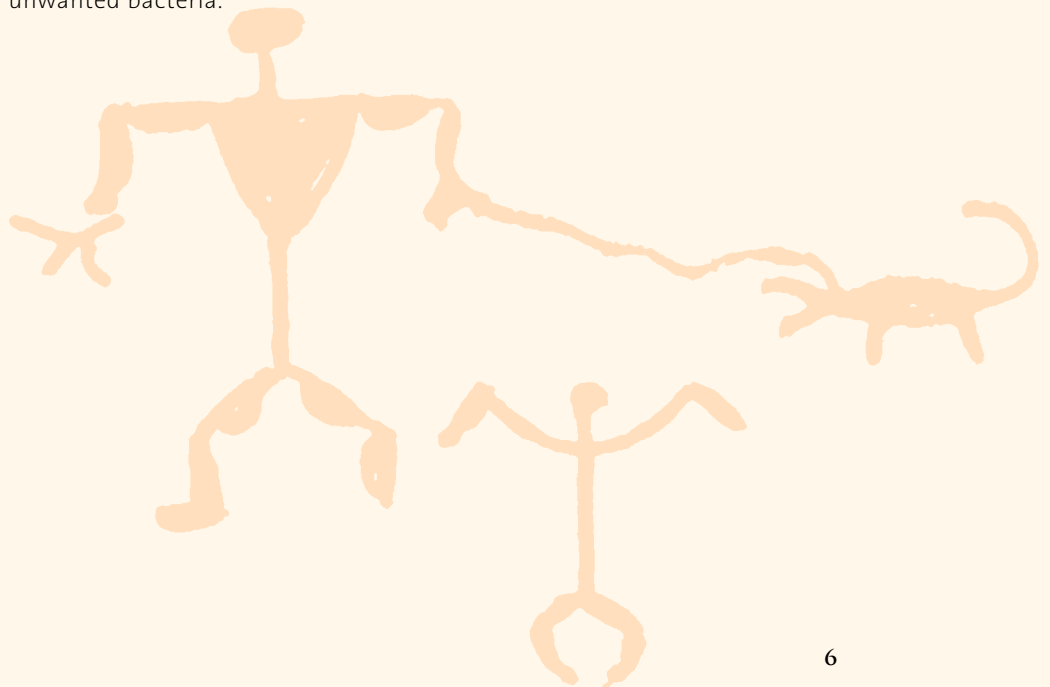
Food safety defects are perhaps as much as four times as expensive as quality defects. Preventing the production of food safety defects, can result in substantial gains in productivity and profitability.

- According to experts' estimates, the production and detection of defective goods costs the food industry from 15% to 30% of gross annual sales
- testing, inspecting and retaining defects can double these costs
- Food safety and quality systems are not only good corporate policy..., they are also good business, and contribute to the overall financial success and well being of the corporation.

Apart from possible human suffering and health expenses, the 'brand equity' of food processors can be heavily affected when their contaminated products reach the market. This is usually followed by a long term decrease in market share and subsequent litigation costs. In other words: producing defective goods or services is ruinous to business, and distributing defective food can irreparably harm the bottom line.

INTERNATIONAL SCIENTIFIC NETWORK

EBI Food Safety's scientific network includes collaborations with universities and research centres in The Netherlands, Switzerland, Belgium, Italy, Portugal, Spain, Canada, China and The United States. Its network is expanding continuously, as the use of phages is recognised internationally as a natural and effective solution to deal with unwanted bacteria.



PRODUCTS

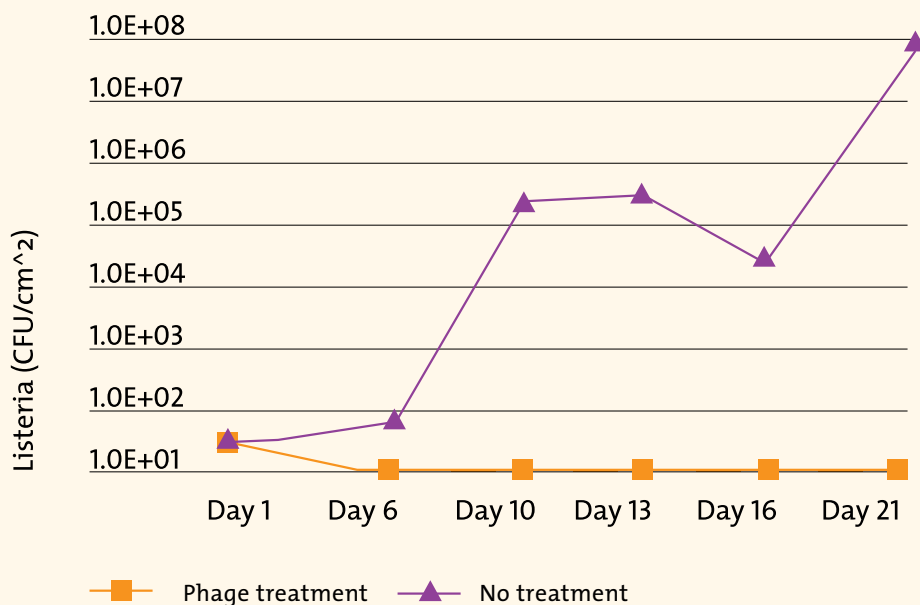
Based on its bacteriophage technology EBI Food Safety develops new anti-microbial agents to prevent pathogen contamination in industrial food production. The company plans to launch several other phage cultures, i.e. for Salmonella, Campylobacter and coliforms. LISTEX™ P100, the company's product against Listeria, is FDA (GRAS) approved, and available worldwide.

LISTEX™ P100 is a culture of safe micro-organisms (bacteriophage preparation) in use as a processing-aid, characterized by its broad spectrum toward *Listeria monocytogenes* strains.

LISTEX™ P100:

- is highly effective in controlling *Listeria monocytogenes* (see graph below)
- can be easily integrated within the daily routine of the normal production process
- does not influence functional fermentation processes.
- does not affect any properties of the food product (chemical, physical, or organoleptic)
- is a natural product, free from genetic modification
- is organic, kosher and non allergenic
- is generally recognized as safe (GRAS) by FDA
- is active under conditions in which the host (*Listeria monocytogenes*) is viable.

Control of *Listeria monocytogenes* on surface ripened cheese



APPLICATIONS AND DISTRIBUTION

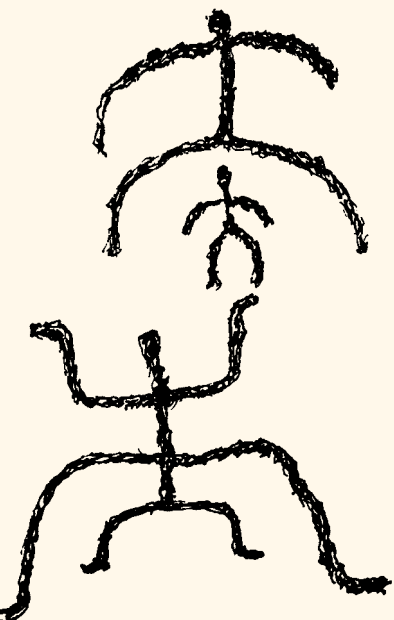
EBI Food Safety's application specialists can assist in examining each phase of production, to minimize bacterial contamination and maximize the efficiency and productivity of the food producers business. Our approach is aimed at ensuring optimal integration of LISTEX™ into the operational routine, to control *Listeria monocytogenes* in the food production environment. Clients can be supported during trials, to optimise the application regime of LISTEX™ in terms of timing and dosage rate. Our technical and commercial staff is aware of the need for a correct alignment of GMP, GHP and QA/QC -policies and -programmes. We can provide input into HACCP programmes to improve the safety of the end product. EBI Food Safety's new "Phage Technology Center" in Wageningen 'Food Valley' accommodates client applications and general research.

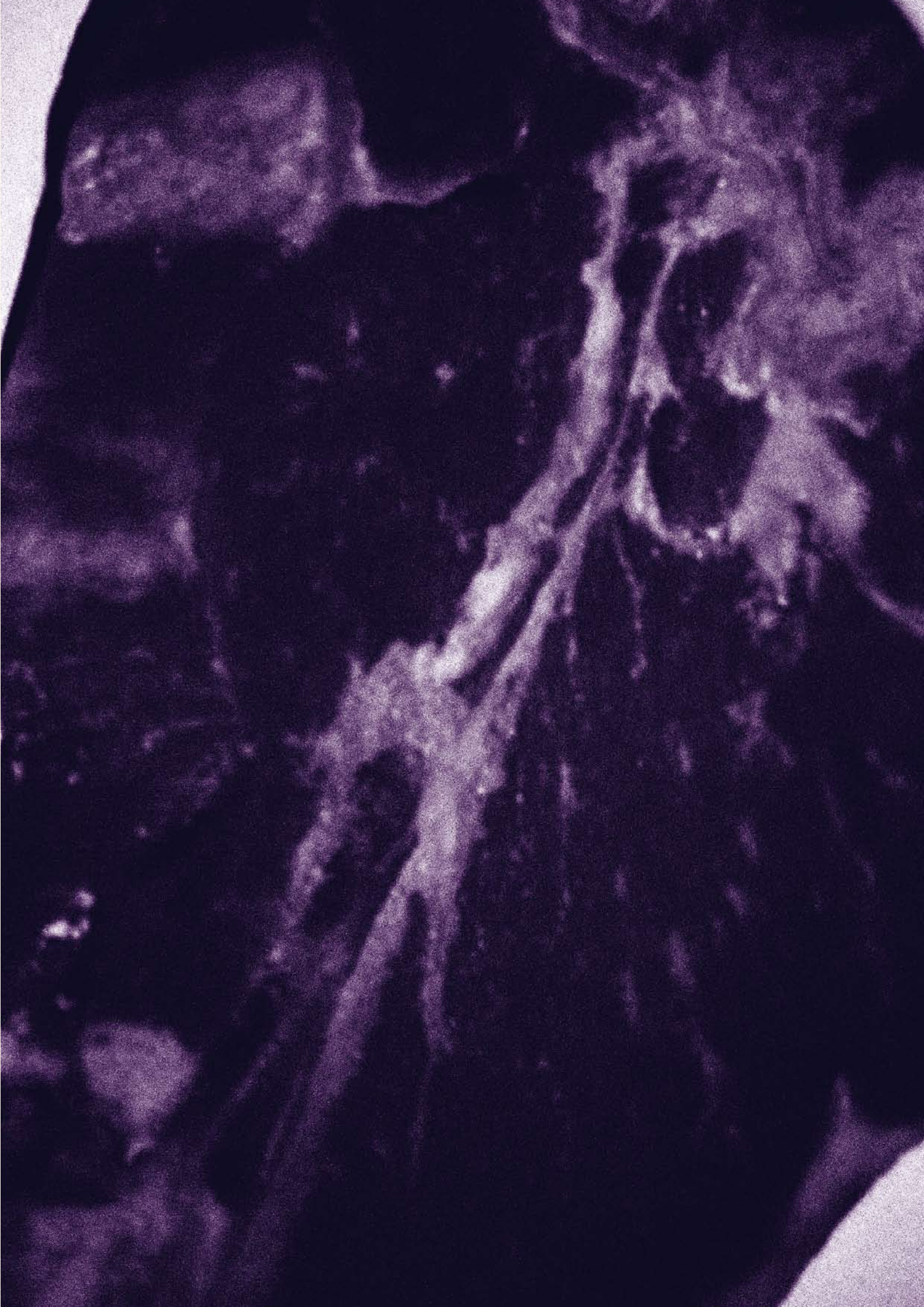
We service customers directly and through selected distributors. Our distributors are selected based on their proven ability to service clients effectively and efficiently in customizing the use of LISTEX™ in their production environment. Please contact our service centre for more information or for coordinates of a distributor close to your premises, at: info@ebifoodsafety.com

FOOD CATEGORIES

Product categories include:

- Cheese
- Meat & Poultry
- Fish
- RTE meal Components





CONTACT INFORMATION

Send your questions to:
info@ebifoodsafety.com

EBI Food Safety

Nieuwe Kanaal 7P
6709 PA Wageningen
The Netherlands
Tel: +31 (0)317 421 414
Fax: +31 (0)317 410 055

www.ebifoodsafety.com



EBI FOOD SAFETY

