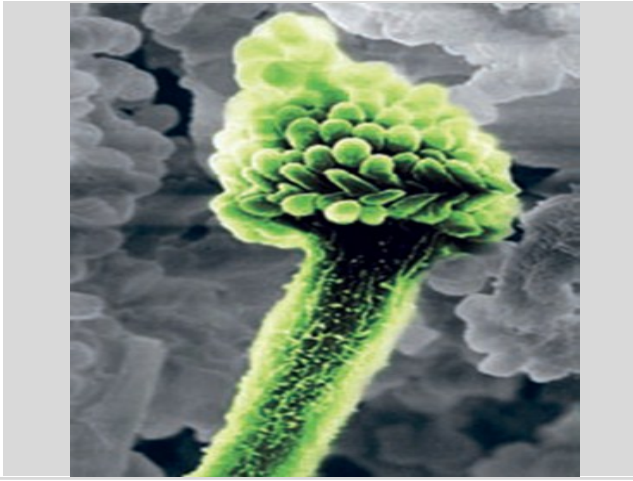




## DISINFECTION SYSTEMS

Make meat  
and meat products  
keep for longer!





## Advanced Air Hygiene disinfection systems—innovative solutions for the meat industry

Air hygiene is a key element in the HACCP concepts for food manufacturers since harmful microorganisms can spread easily through the air. The disinfection systems from Advanced Air Hygiene provide an efficient remedy to this problem.

At the heart of these systems are UV-C emitters with a primary emission wavelength of 253.7 nm. The particular advantage of these systems is that they produce no ozone.

### UV-C technology – the most natural form of disinfection

UV-C radiation is a natural component of sunlight. The anti-bacterial effect of this radiation has been known for a long time. A wavelength of 253.7 nm triggers changes in the genetic material of the microorganisms, causing them to die. Unlike other systems, no thermal or chemical treatment is necessary.

### Air disinfection – the icing on the cake of air management

Demands for increased freshness and longer shelf life of produce are constantly increasing. The quality of a food product is measured by its natural freshness, meaning that this can form a decisive competitive advantage for many food producers.

Yet being able to retain freshness throughout the production process and beyond is often a seemingly intractable problem, particular in the case of sensitive foods.



### Sausage in general

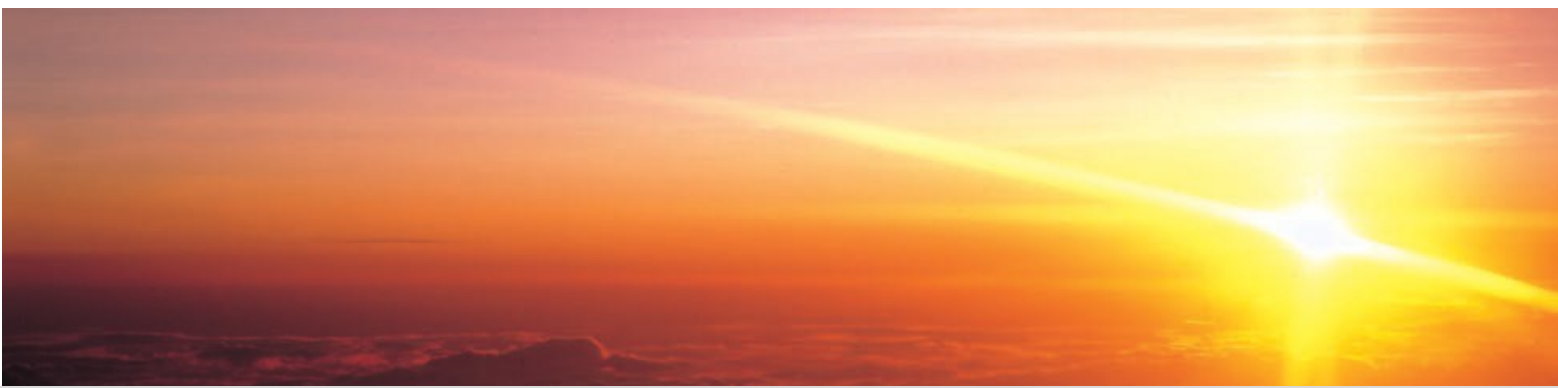
The targeted use of microorganisms in the production of raw sausage (salami etc.) is what gives these products their typical taste. However, these self-same microorganisms are what cause the rapid spoilage of cooked sausage and pre-cooked sausage in particular.

Air gives bacteria, fungi and yeasts a “free ride” and spreads these microorganisms between production areas. A key route in this process is via ventilation and air-conditioning systems. Particularly companies that produce both types of sausage should recognise the urgency of preventing this airborne transmission of germs.

The biggest danger when conditioning salami via the targeted application of the starter culture comes from “wild” cultures. Disinfection of the air prevents the airborne spread of these “wild” cultures without affecting the maturation process.







The inherent proneness of cooked and pre-cooked sausage to spoiling can be considerably reduced by disinfecting the air during packaging. After the heat treatment, the sausages are practically germ-free. A re-colonisation of fungi and bacteria on the surface of these sensitive sausage products represents a very large risk.

Germ-carrying air also poses risks to products in the manufacture of Wiener and Frankfurter sausages. For instance, the colonisation of airborne microorganisms can pose significant problems for these products after the boiling process and removal of the casings.

#### Types of microbiological spoilage of sausage products

Type of micro-biological spoilage	Symptoms	Product	Main microorganisms involved	90% disinfection mWs/cm <sup>2</sup>	99,9% disinfection mWs/cm <sup>2</sup>
Rancidity	Pungent, scratchy smell and taste, yellowish fatty parts	Raw sausage	<i>Bacillus anthracis</i> (in conjunction with chemical reactions)	4.5	13.7
Fungal infestation	Mycel formation on the surface, dank, musty, mouldy smell	Raw sausage, cooked sausage	<i>Penicillium digitatum</i> <i>Penicillium expansum</i> <i>Penicillium roqueforti</i> <i>Aspergillus amstelodami</i> <i>Mucor mucedol</i>	44.0 13.0 13.0 66.7 65.0	132.0 39.0 39.0 200.1 195.0
Rime formation	Dry, whitish coating, mouldy smell, sometimes cheese-like	Raw sausage	<i>Micrococcus candidus</i> <i>Micrococcus piltonensis</i> <i>Micrococcus sphaeroides</i> Yeasts: Baker's yeast Brewer's yeast Common baker's yeast <i>Saccharomyces ellipsoideus</i> <i>Saccharomyces spores</i> <i>Saccharomyces cerevisae</i> <i>Saccharomyces turpidans</i>	6.3 8.1 10.0  3.9 3.3 6.0 6.0 8.0 6.0 9.0	19.0 24.0 30.0  11.7 9.9 18.0 18.0 24.0 18.0 27.0
Film covering	Slimy surface, sweaty, cheese-like smell, moist, glistening surface	Raw sausage	<i>Micrococcus candidus</i> <i>Micrococcus piltonensis</i> <i>Micrococcus sphaeroides</i>	6.3 8.1 10.0	19.0 24.0 30.0
Slime formation	Greyish-white residue, musty-mouldy smell	Cooked sausage	<i>Micrococcus candidus</i> <i>Micrococcus piltonensis</i> <i>Micrococcus sphaeroides</i> <i>Streptococcus hemolyticus</i> <i>Streptococcus lactis</i> <i>Streptococcus viridans</i> <i>Pseudomonas aeruginosa</i> <i>Pseudomonas fluorescens</i>	6.3 8.1 10.0 2.2 6.1 2.0 5.5 3.5	19.0 24.0 30.0 6.6 18.0 6.0 16.5 10.5
Green discolouration	Green discolouration of the sliced surface	Cooked sausage	<i>Lactobacillus</i> <i>Leuconostoc</i> <i>H<sub>2</sub>S-bildende Bakterien</i>		

## Advanced Air Hygiene disinfection systems—for the protection of your products



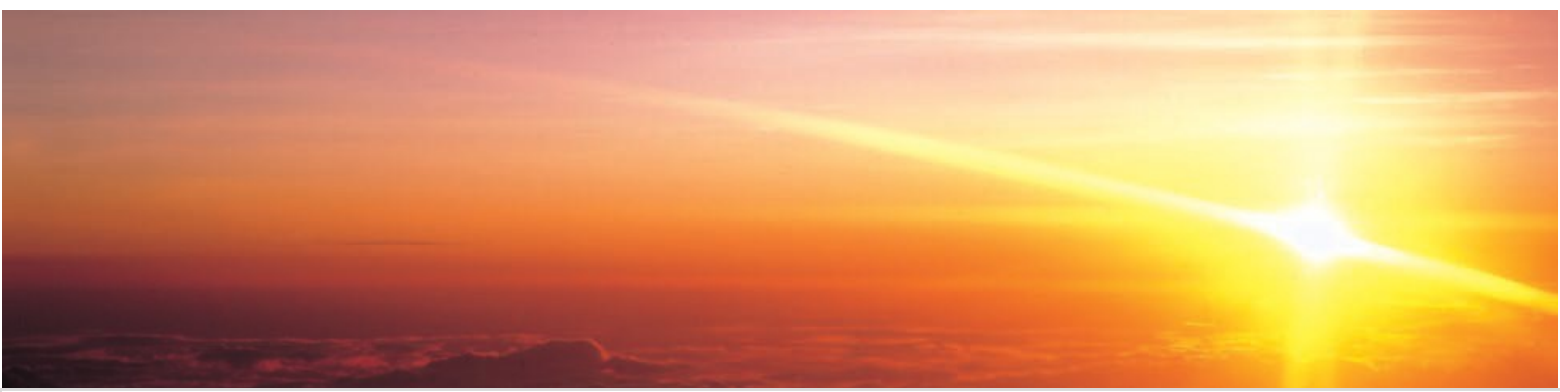
### Meat

The symptoms of the spoiling of meat and meat products are diverse in nature. Decay is caused by microbial degradation of the meat, amongst other things. Bacteria form grey/white, often slimy residues on the surface. Fungi, on the other hand, often cause green-black symptoms of spoilage. Yet it is not possible to process meat with a complete absence of germs, even under perfect hygienic conditions.

### Types of microbiological spoilage of meat

Type of micro-biological spoilage	Symptoms	Main microorganisms involved	90% disinfection mWs/cm <sup>2</sup>	99,9% disinfection mWs/cm <sup>2</sup>
Mustiness	Soft consistency, copper-red discoloration when sliced, turning green on exposure to air, mouldy, sour smell, sulphurous	Essentially enzymatic decay processes (not true microbiological spoilage)		
Fungal infestation	Dank, mouldy smell, mycel formation on the surface	<i>Penicillium digitatum</i> <i>Penicillium expansum</i> <i>Aspergillus amstelodami</i> <i>Mucor mucedol</i>	44.0 13.0 66.7 65.0	132.0 39.0 200.1 195.0
Rime formation	Whitish crumbly dry residue, sometimes fruity smell	<i>Micrococcus candidus</i> <i>Micrococcus piltonensis</i> <i>Micrococcus sphaeroides</i> Yeasts: Baker's yeast Brewer's yeast Common baker's yeast <i>Saccharomyces ellipsoideus</i> <i>Saccharomyces spores</i> <i>Saccharomyces cerevisiae</i> <i>Saccharomyces turpidans</i>	6.3 8.1 10.0  3.9 3.3 6.0 6.0 8.0 6.0 9.0	19.0 24.0 30.0  11.7 9.9 18.0 18.0 24.0 18.0 27.0
Discolouration	Red blotches Blue blotches Yellow blotches Yellow/red blotches Phosphoric luminescence	<i>Serratia marcescens</i> <i>Pseudomonas aeruginosa</i> <i>Pseudomonas fluorescens</i> <i>Aspergillus flavus</i> <i>Sarcina lutea</i> <i>Micrococcus candidus</i> <i>Micrococcus piltonensis</i> <i>Micrococcus sphaeroides</i>	2.5 5.5 3.5 60.0 19.8 6.3 8.1 10.0	7.2 16.5 10.5 180.0 59.0 19.0 24.0 30.0





The principal reason for spoilage is the fact that the access of microorganisms is not restricted, particularly in the air.

The airborne spread of germs between processing locations represents a further major risk. For instance, the spread of microorganisms from the highly contaminated delivery area to the deboning, processing, storage and packaging areas has a serious impact on the shelf life of the products.

Air disinfection can therefore be regarded as an effective additional hygiene measure that considerably reduces the spread of airborne microorganisms via the air.



### Types of microbiological spoilage of salt meat

Type of micro-biological spoilage	Symptoms	Main microorganisms involved	90% disinfection mWs/cm <sup>2</sup>	99,9% disinfection mWs/cm <sup>2</sup>
Brine spoilage	Brine cloudy, viscous, foam formation, smell musty, putrid, meat musty (superficially), pungent smell, meat glassy, sticky, slimy, raw inside, soft consistency	<i>Alcaligenes</i> <i>Vibrio</i> <i>Bacillus anthracis</i> <i>Pseudomonas aeruginosa</i> <i>Pseudomonas fluorescens</i>	4.5 5.5 3.5	13.7 16.5 10.5
Internal putrefaction	Mouldy smell, putrid around bony parts	<i>Bacillus anthracis</i> <i>Clostridium</i>	4.5	13.7
Fungal infestation	Mycel formation on the surface, dank, mouldy smell	<i>Penicillium digitatum</i> <i>Penicillium expansum</i> <i>Aspergillus amstelodami</i> <i>Mucor mucedol</i>	44.0 13.0 66.7 65.0	132.0 39.0 200.1 195.0
Mustiness	Sweet or sour smell, sometimes sulphurous	Essentially enzymatic decay processes (not true microbiological spoilage)		

## Advanced Air Hygiene disinfection systems—for the protection of your products

### Poultry

The surface of poultry is an ideal feeding ground for microorganisms. The cool room represents a particularly critical point (air cooling or air-spray cooling) in the Poultry processing flow. The subsequent steps up to the ultimate packaging of the poultry pose a permanent risk of colonisation by airborne microorganisms.

Disinfection using our UV-C systems is highly recommended, particularly during these production steps that are highly sensitive to microorganisms.

Our UV-C disinfection units and systems can reduce the proportion of microorganisms in the air by up to 99.9 %.

Room air is routed very close to UV-C emitters, disinfected and returned to the environment. As the system is fully encapsulated, no radiation escapes from the unit.

The release of dangerous ozone familiar from traditional units is prevented via the use of specially coated quartz glass during the manufacture of the burner bulb, meaning that the unit can be operated continuously without harming health or damaging the goods.

### Disinfection also possible in moist rooms

Advanced Air Hygiene can supply a UV-C air disinfection unit in compliance with protection class IP 54 (protected against dust and splashing water) for those production areas that regularly need to be washed with water.

A further plus point of this unit is its high air throughput, which makes it suitable to deployment in large rooms.

### Air disinfection – preventing complaints about quality

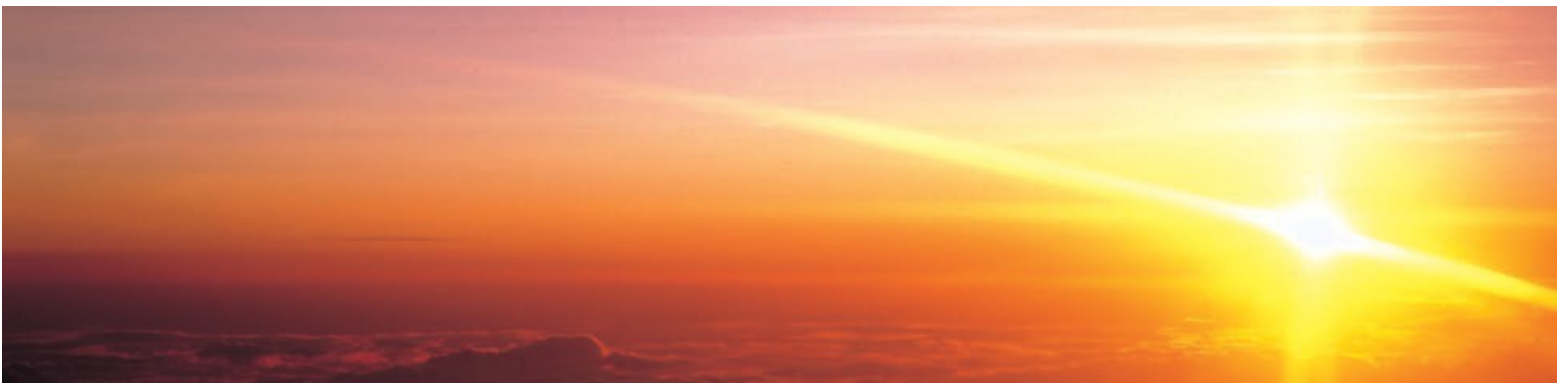
Installing the disinfection systems supplied by Advanced Air Hygiene helps you achieve a high quality product and thus prevent complaints about quality that can damage your reputation and image.

No producer of meat products can afford frequent complaints, particularly with regard to the large retailers. Potential consequences are the loss of listings and thus a large fall in sales.

Our disinfection systems ensure that you comply with the requirements of consumer protection laws and VDI 6022 in your hygiene and air management. The systems contribute towards the fulfilment of HACCP concepts.

#### Seven benefits for your success:

- The shelf-life of meat and meat products is considerably increased
- Complaints are reduced significantly
- The freshness of the products can be guaranteed for longer
- Hygiene standards are safeguarded
- The products retain constant weight and colour for longer
- Product quality as a whole is increased
- Warehousing and logistics costs are reduced



## Areas of deployment

Meat and meat product cold rooms, deboning room, packaging and filling room, maturing and storage room, sales rooms.

## Research and development

Specialists are constantly working on improvements and innovations in our partner's research and development centre in Germany – naturally in consultation with customers and suppliers.

## Safety – the utmost priority

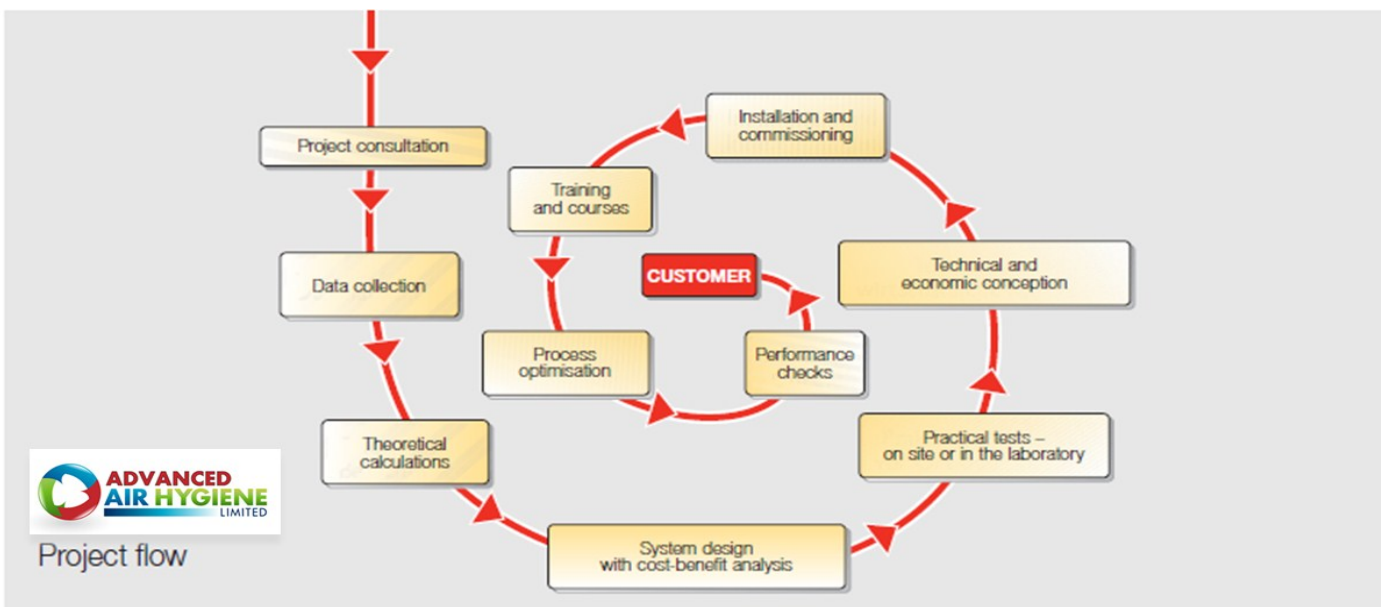
All systems, units and components comply with the Highest safety standards. Thorough checks, training and commissioning by our trained staff are a matter of course.

## Planning and consultation

Our application specialists plan your system together with you and provide consultation in order for you to find the right solution. We are the expert at your side, starting with measurements on site, laboratory tests via feasibility studies right up to installation.

## Service

Our aim is to ensure that your investment pays off. For that reason we also look for opportunities to reduce your costs and optimise processes after installation. If the system malfunctions, our specialists are quickly at your service.



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