



Case study fresh meat de-germination technology in the areas cooling an deboning



Case study AirSolution de-germination technology in the areas cooling and deboning

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2. Introduction

In the stabilization of the hygienic status of the air and surfaces in the areas of cooling and deboning (rough and fine deboning) Process and ambient air has a significant impact on the product hygiene. In order to stabilize them through the entire process after the delivery of goods, via the intermediate storage in the cooling room, to processing and packaging , production facilities were equipped with the AirSolution hygiene technology . There was an analytical support to show the results transparent.

3. Installation for hygienic implementation

It was carried out an installation of 8 AirSolution de-germination modules in the areas of cooling, deboning and then following along the deboning-belts

- Cooling room (3 nebulizer units)
- Deboning area vaporizer (rough- & fine deboning) (3 nebulizer units)
- Deboning-belt (2 nebulizer units)



AirSolution de-germination in the cooling room

The control of the 8 de-germination modules was carried out by a central control panel of AirSolution with metering station (de-germination agent - tank and pump). At this cabinet, the following connections are required:

- Power connection: 230 V / 50 Hz
- Oil- and wather-free compressed air: at least 7 bar
- Internet connection for remote service



Control cabinet & tank

The de-germination system is running with the de-germination agent Air Solution L.O.G. four.

The system is operate with the following settings (application rate per nebulizer per hour):

Position	Value	Unity
Cooling room (800 m ³)	90	ml / h
Deboning area (1100 m ³)	120	ml / h
Deboning belt	100	ml / h
Total	310	ml / h

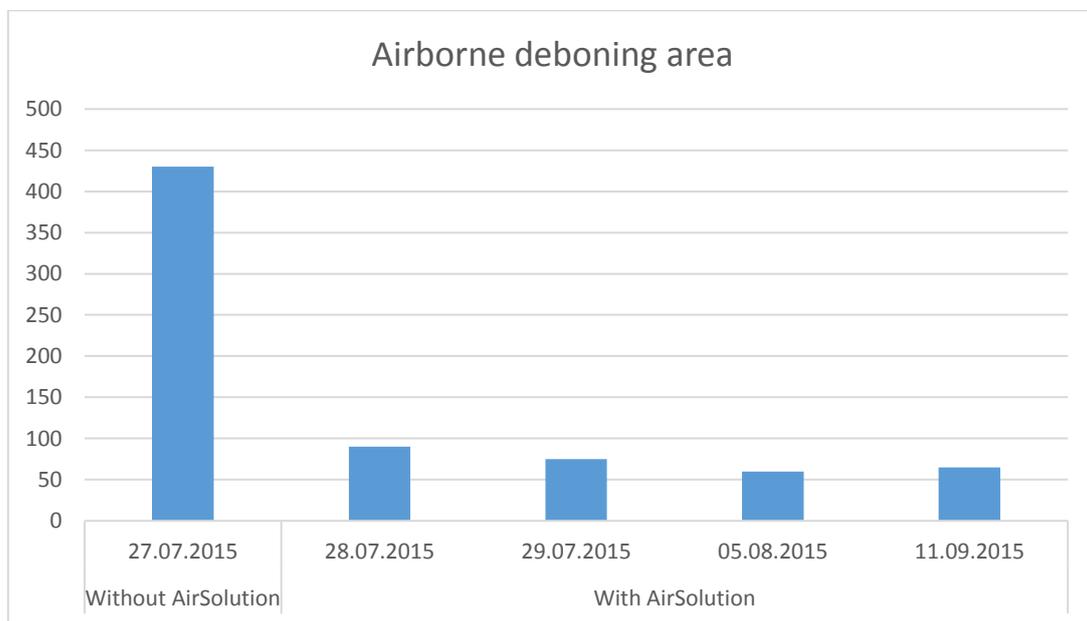
The operating hours consumption is thus comparable applications at 300 - 350 ml / h corresponding to a cost factor of about 3.90 - 4.50 EUR de-germination agent per hour.

4. Results of the air sampling and surfaces in the cooling room

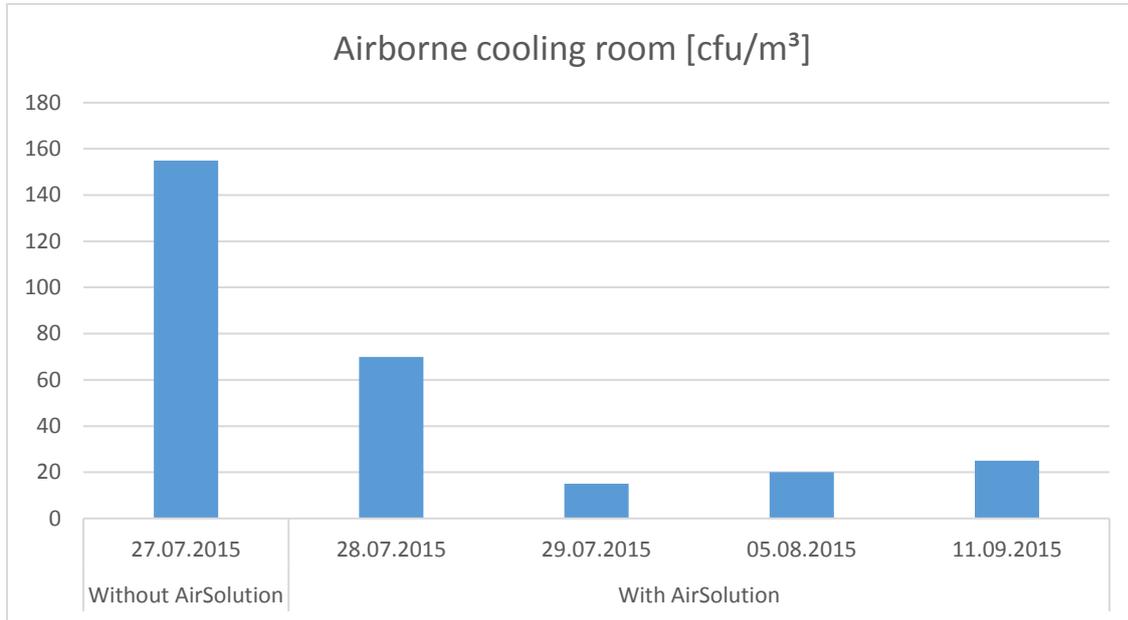
In the cooling room for pork sides and cuts 3 nebulisers were installed to optimally secure the room air as well as surfaces (evaporator, walls etc.) hygienically.

The airborne germ collections were taken in the deboning area and in the cooling room before use of AirSolution technique and during use and the results are shown below.

The additional measurements over a sustained long period showed a continuous stabilization of airborne loads.

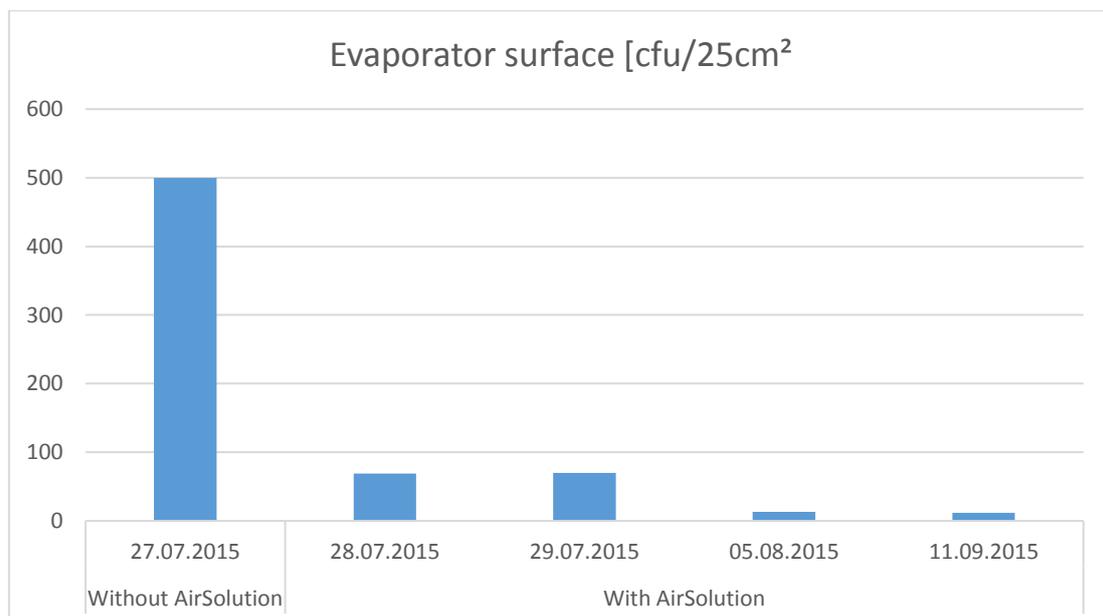


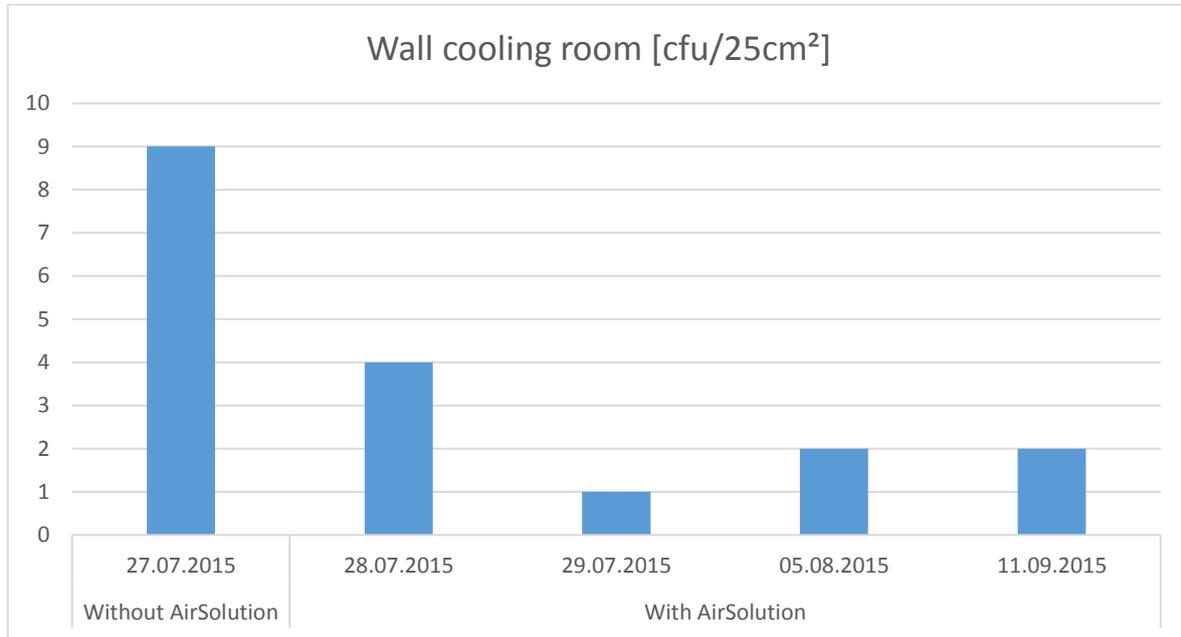
Sampling	There were 3 samples / day taken at beginning, middle & end of production		
Temperature	12 °C		
Rel. humidity	85%		
Outside-parameter	19 °C; 62 % rel. H		
Consumption	120 ml/h	14 hours	1680 ml



Sampling	There were 3 samples / day taken at beginning, middle & end of production		
Temperature	6 °C		
Rel. humidity	90%		
Outside-parameter	19 °C; 62 % rel. H		
Consumption	90 ml/h	14 hours	1260 ml

There continues to be a evaporator in the cooling room and a wall were analyzed for the surface bacterial load.



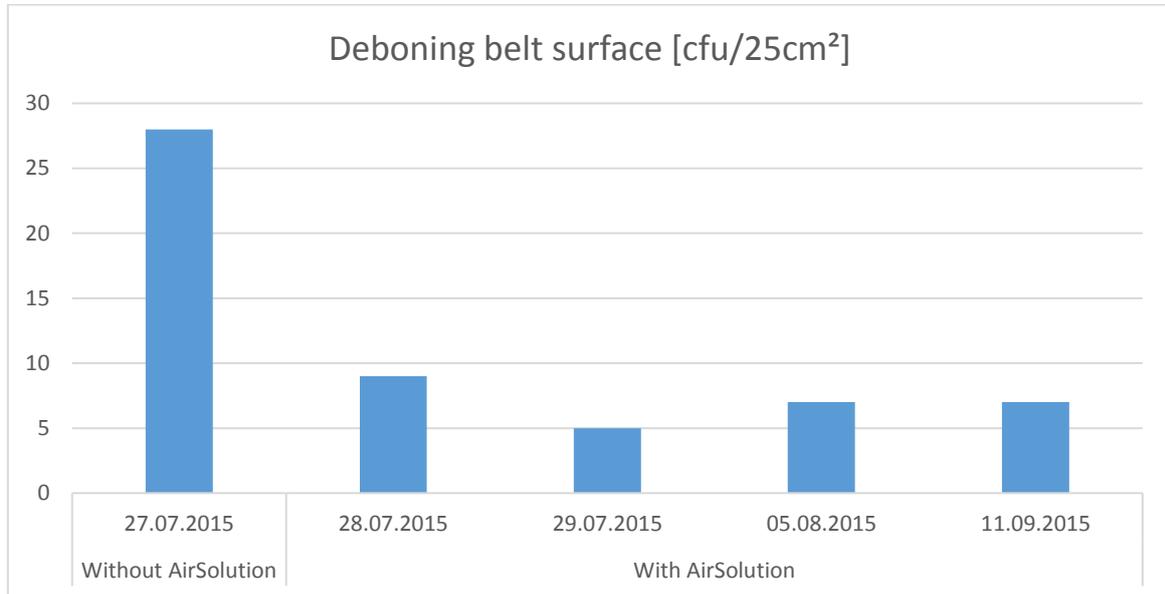


The results show a significant reduction of the status of bacteria in the ambient air, as well as the surfaces in the cooling room. Thus, an optimal environment for the products will be created to protect hygienically before germ entry before further processing **(secure germ prevention)**

5. Results of the surface test at the deboning belt (fine deboning)

Samples are taken at the deboning belt (fine deboning) surface tests in the form of contact samples before use of AirSolution technology to hygiene critical points of the deboning belt. The same measurement points were then sampled on other days during the use of AirSolution technology.

The results are shown in the following.



Sampling	There were 9 samples / day taken at beginning, middle & end of production		
Temperature	12 °C		
Rel. humidity	85%		
Outside-parameter	19 °C; 62 % rel. H		
Consumption	100 ml/h	8 hours	800 ml

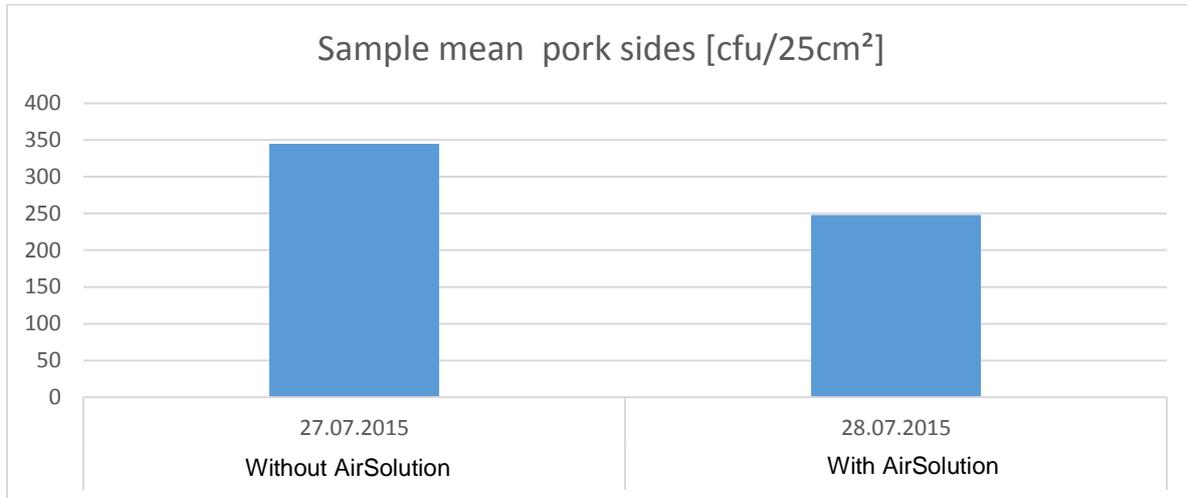
In this part is a reduction of the germ status with the same production volume and the AirSolution de-germination technology detected.

6. Results of the product test

There were a product test on 4 sampling and without the AirSolution conducted fogging .

The cooling room was applied over the entire residence time of the product with the aerosol mist .

The samples were taken without AirSolution at the product entrance.



10 samples were taken from different sides of pork. These microbiological enumerations created an average. There was a stabilization of the products within one working day.

7. Maximum allowable concentration (MAC) (measured by the Employer's Liability Insurance Association):

In order to prove the safety of the procedure for the employees in the production, there have been done measurements by Employer's Liability Insurance Association measurements of the content of hydrogen peroxide in the air, measured next to the fogging units.

The measured values have been significantly below the maximum allowable workplace exposure limit.

For this measurement, it must be taken into account that in the same process environment used detergents and disinfectants have also an impact on the concentration of hydrogen peroxide in the air, which have not undergone any detailed recording here.

Working area	Substance	Max. allowable concentration after TRGS 900 [mg / m ³]	Measured concentration [mg / m ³]
Meat processing area	Hydrogene peroxide	0,71	0,25

8. Conclusion

Through the influence of AirSolution Hygiene technology in continuous use in the cooling room and along the separation to packaging, a significant reduction in airborne bacteria and the surface load was measured at several customer applications achieved and maintained permanently, leading to a sustainable health protection, which therefore also affects the product positively.

9. Methods

Air monitoring

Enumeration:

- Determination of total count, yeast and moulds

Implementation:

- Air born collector: MERCK MAS – 100[®] ECO; Fa. MERCK KGaA
- Air volume: 200 L

Incubation and evaluation:

- Total count: Plate Count Agar (Fa. OXOID) + 32°C / 48 h
- Yeasts and moulds: Sabouraud 4% Glucose (Fa. OXOID) +23°C / 96 h

Representation:

- Results are given as CFU / m³ (Colony Forming Units).
- Measured results were multiplied as follows: e.g. 100 CFU / m³ = 20 CFU / (200 L x 5).
- Overgrowth = Sample surface before end of incubation period overgrown with germs and therefore not countable.

Surface tests

Enumeration:

- Determination of total count, yeast and moulds

Incubation and evaluation:

- Total count : Plate Count Agar (Fa Biotest AG) + 32 ° C / 48 h
- Yeasts and molds: Sabouraud 4% glucose (from Biotest AG) + 23 ° C / 96 h

Representation:

- Results are given as CFU / 25 cm² (Colony Forming Units).
- Overgrowth = sample area before the end of incubation period overgrown with germs and therefore not countable.