

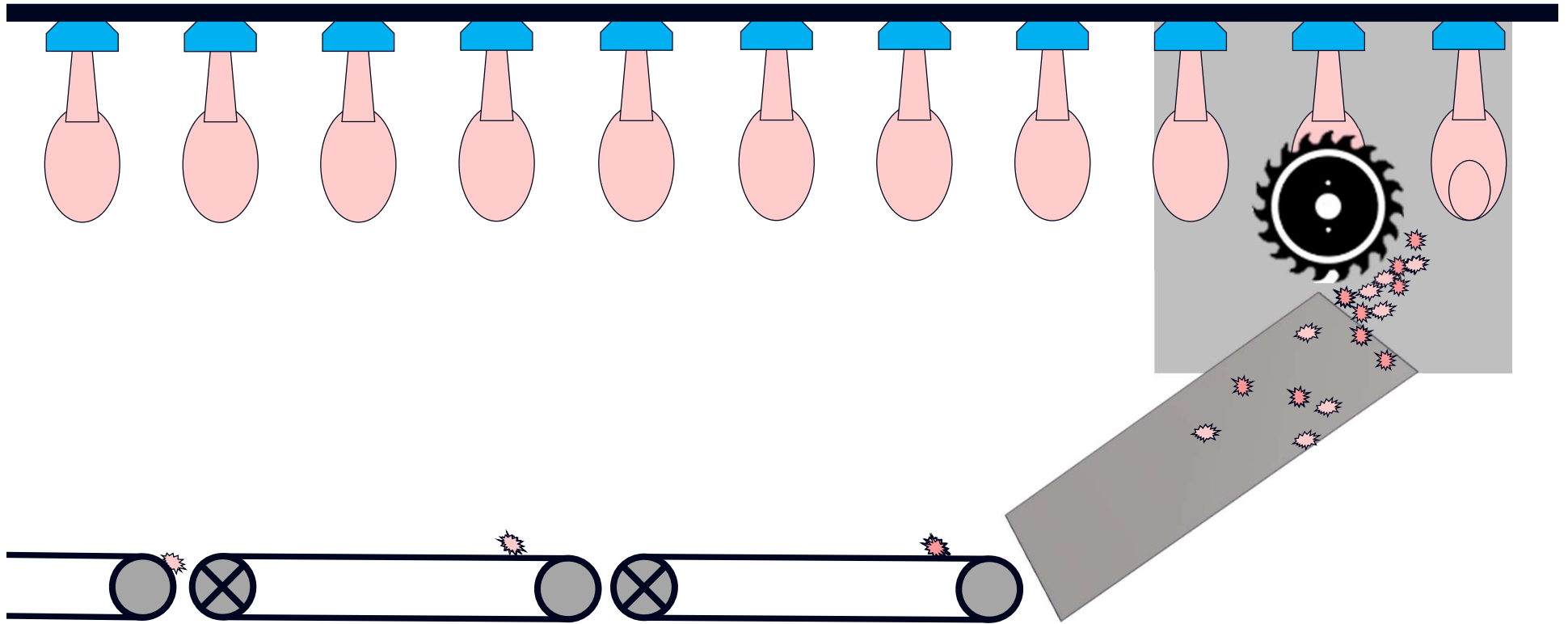


Innovative Design for food safety

Centre of Excellence Hygienic Solutions – DE21
Dr. Ing. Stephan Kronholz
Baal - Germany

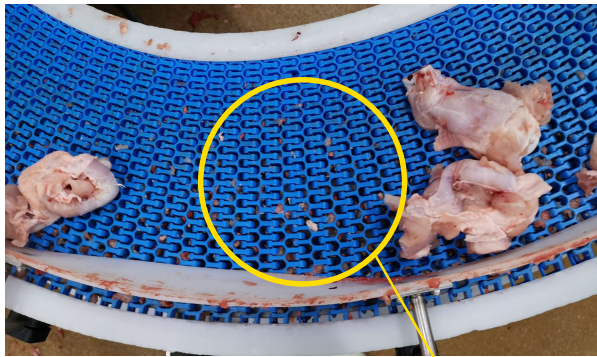
Novotel Suvarnabhumi Airport Hotel



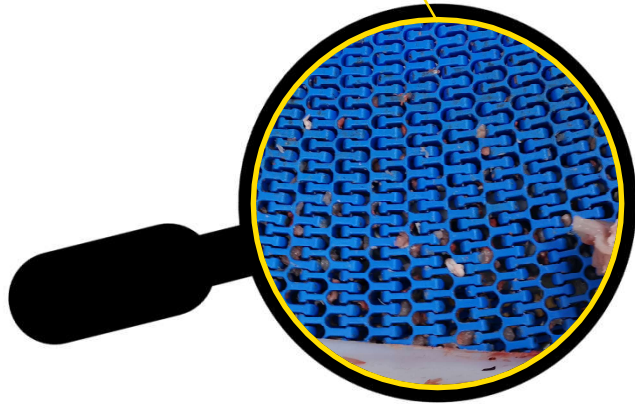
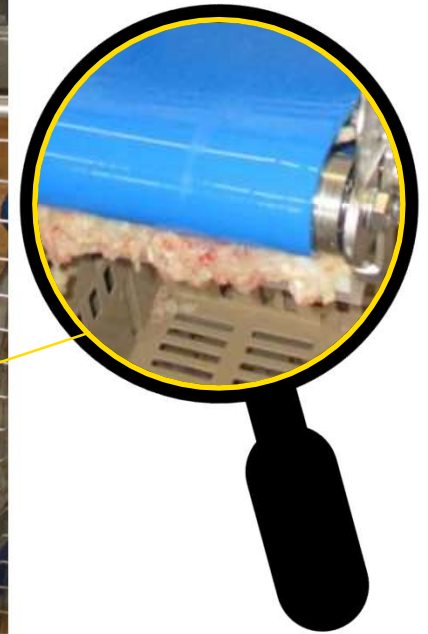
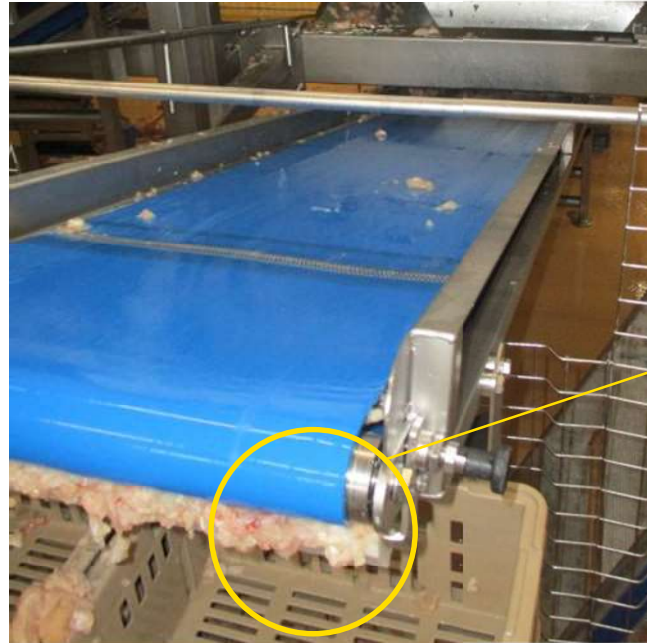


Ultra Hygienic Transfer

What is the Customer pain ??



Food contact surfaces, which are in direct contact with meat residue over a longer period, generate a high risk for cross contaminations.



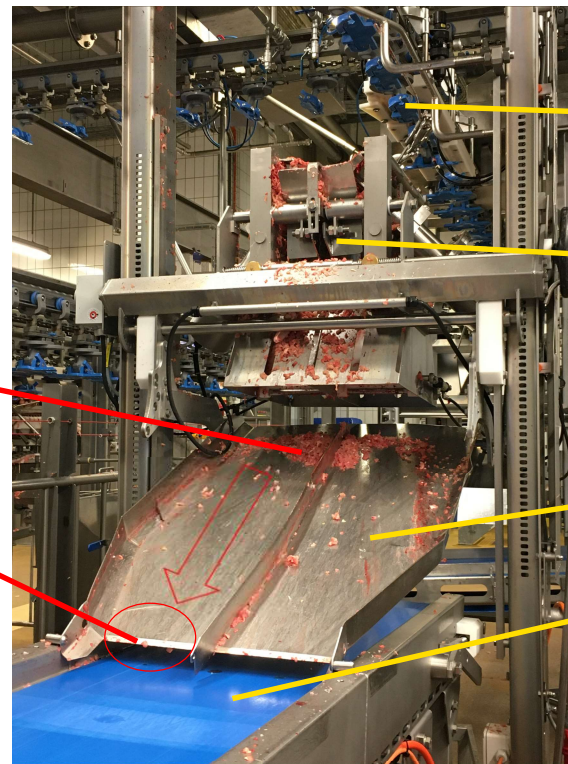
Ultra Hygienic Transfer

Where does the residue come from ??

The cut-up systems are the source of the residue.
The chutes feed the conveyors with residue

Residue accumulation

Residue permanently slides down the chute and constantly feeds the food contact surface of the conveyor.



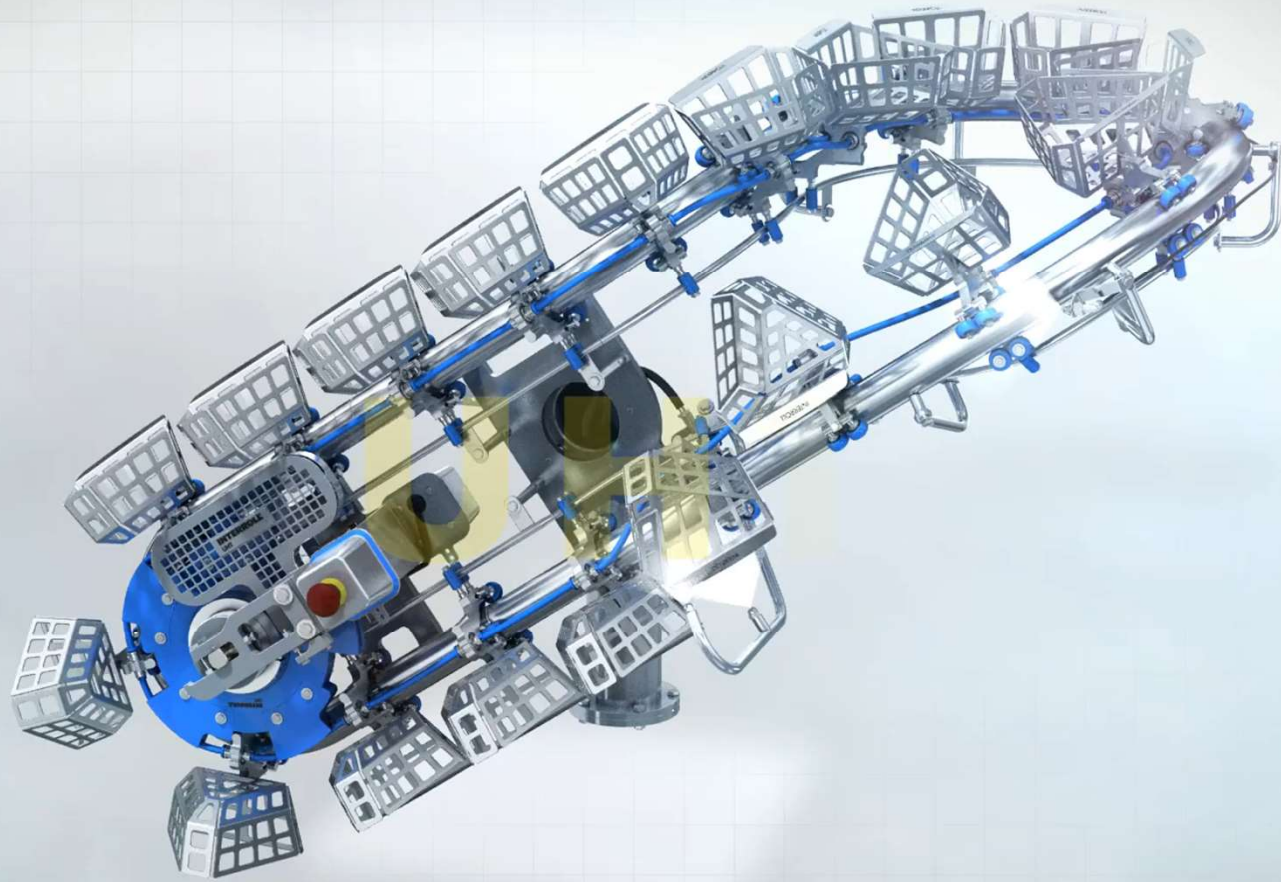
Chain conveyor

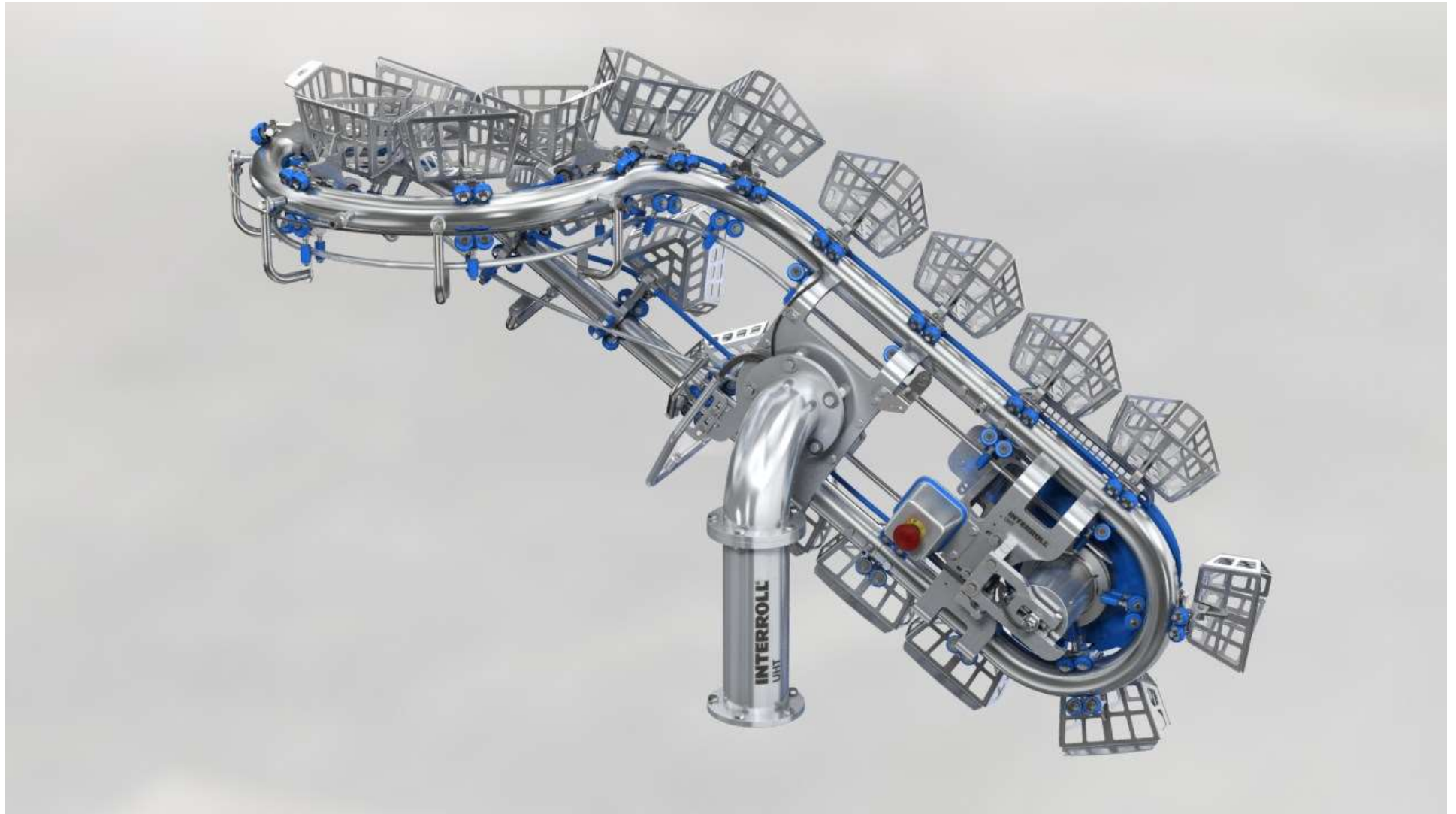
Cut-up system

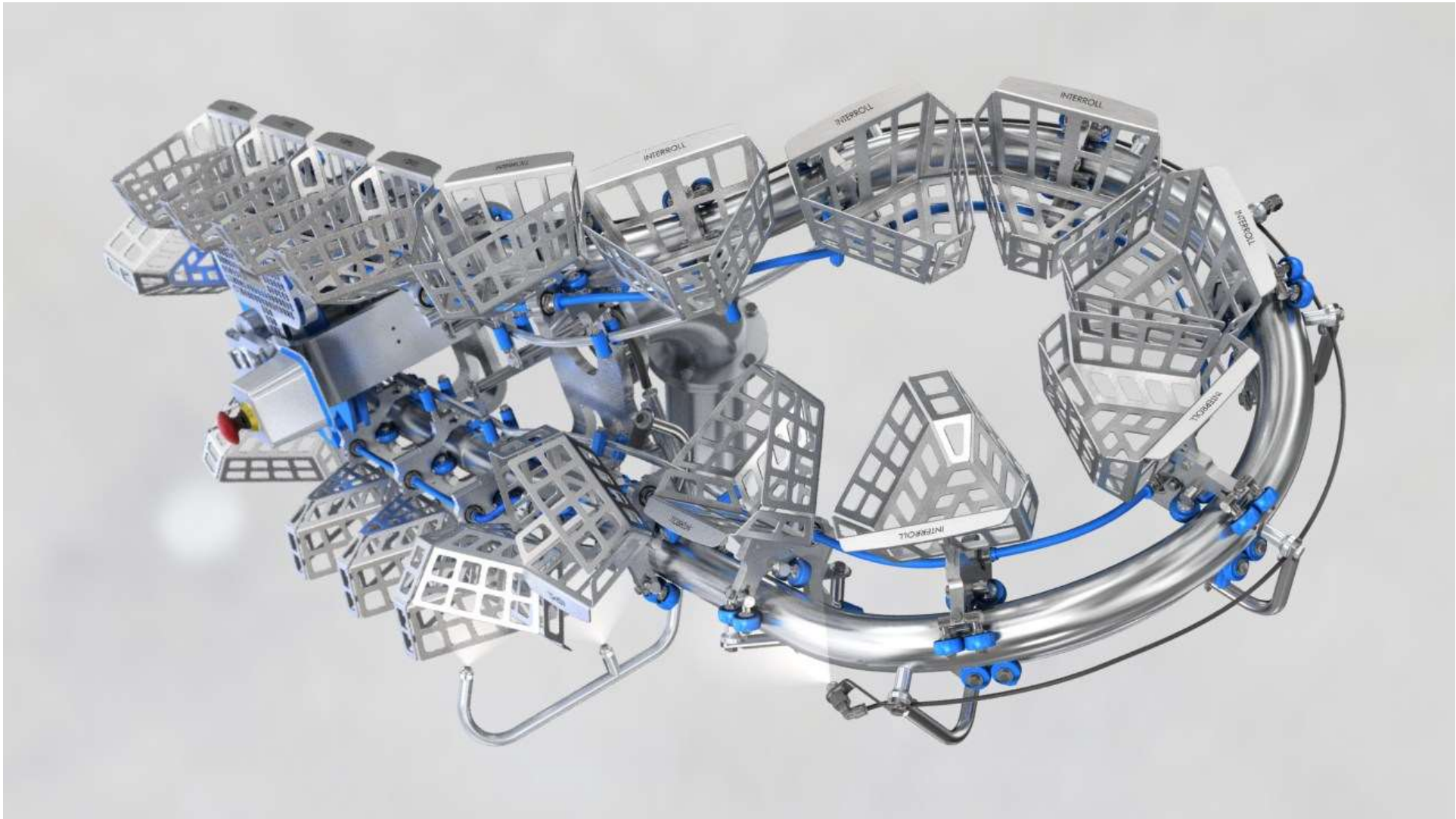
Chute

Belt conveyor

INTERROLL

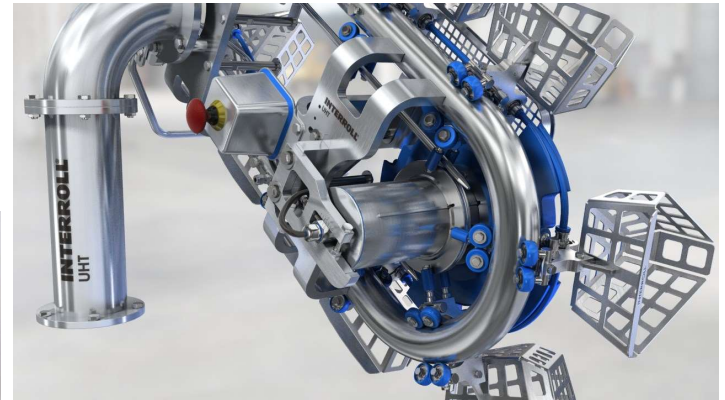
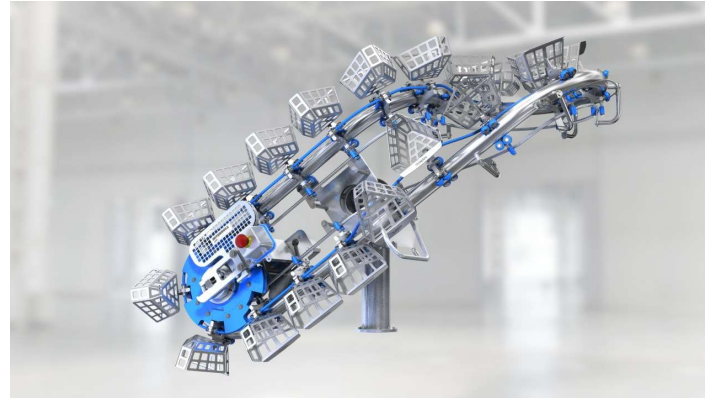






Ultra Hygienic Transfer USP`s - Superior Design

- **No alignment** (sensor) between hanging conveyor and HHT **needed**
- **Stand alone system** (only power line for drum motor needed + supply of CIP)
- **Mounted to the cut up** traverse and **rotatable** to enable cleaning in night shift
- **Open structure** and thus hygienic design
→ easy to clean (EHDG)
- **Modular concept** and **adjustable for all applications** (breast, wings, leg)
- **Clean in place (CIP)** already **included**



Ultra Hygienic Transfer

Setup of first field test



Ultra Hygienic Transfer

Measurement procedure first field test

Method:

Mass of transferred visual residue on & around the belt conveyor.

Unit: [g] gram

How was it measured?

All **visual meat residue** on the conveyor belt, on the conveyor frame, at the scraper and on the floor in direct proximity to the belt conveyor was hourly collected and the **weight was measured**.

The measurement should answer the following question:

How much residue gets **transferred** from the cut up to the belt conveyor?

Logical assumption:

Less residue spread= less cleaning



Method:

ATP wipe test on belt surface

Measurement unit: [RLU] relative light units

How was it measured?

A representative **area on the food contact surface** of the belt was **swapped hourly**. The sample was activated with the enzyme and was shaken for approx. 10 seconds.

The **[RLU] relative light units were measured** within one minute by the ATP measurement device.

The measurement should answer the following question:

How much ATP is **on the food contact surface** during production?

Logical assumption:

Low number of ATP= low number of bacteria



Method:

Bacteria sample wipe test on belt surface

Measurement unit: [CFU/ cm²] colony forming unit/ cm²

How was it measured?

A representative **area on the food contact surface** of the belt was swapped hourly.

The swapping contact time was 10 seconds.

The sample was **evaluated by an external laboratory** after two days breeding time.

The measurement should answer the following question:

How much colony forming units/ cm² are **on the food contact area**?

Logical assumption:

Low number of CFU/cm²= low risk for cross contamination



Method:

Bacteria sample of random wings

Measurement unit: [CFU/ g] colony forming unit/ gram

How was it measured?

Random sample wings have been hourly **hygienically packed** into a suitable foil bag. The wing samples have been **evaluated by an external laboratory**.

25g of meat per wing sample were given to a mixer. The minced sample was examined on [CFU/ g] colony forming unit/ gram

The measurement should answer the following question:

What is the **effect of contaminations** on the conveyor surface, **to the final product**?

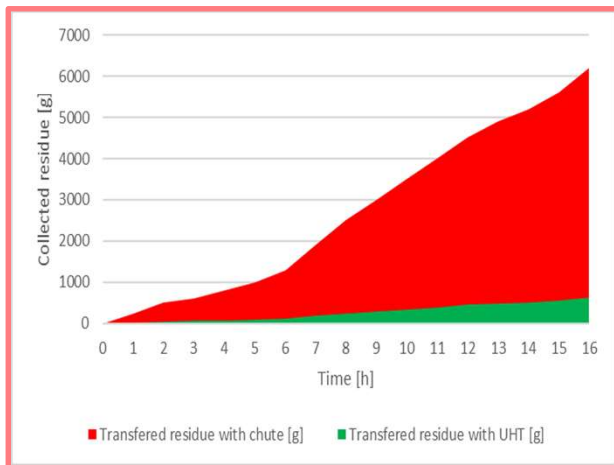
Logical assumption:

Low number of CFU/g= low risk for food borne illnesses and probably longer shelf life

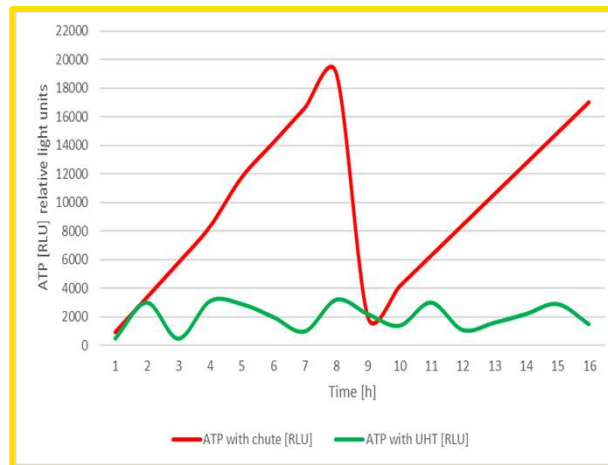


Ultra Hygienic Transfer Measurement results first field test

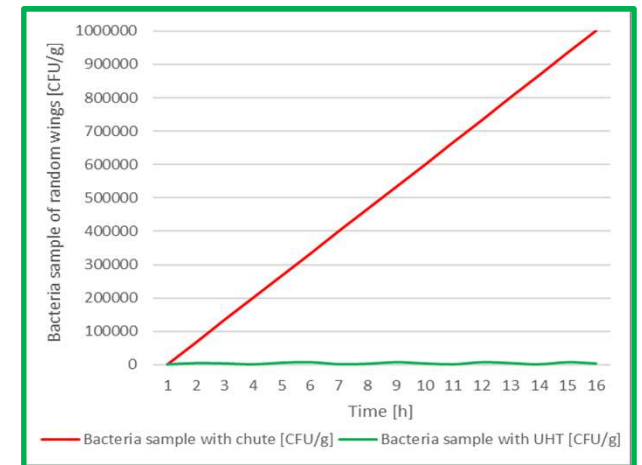
A stainless-steel chute spreads >85% of residue through the following production lines, compared to an UHT



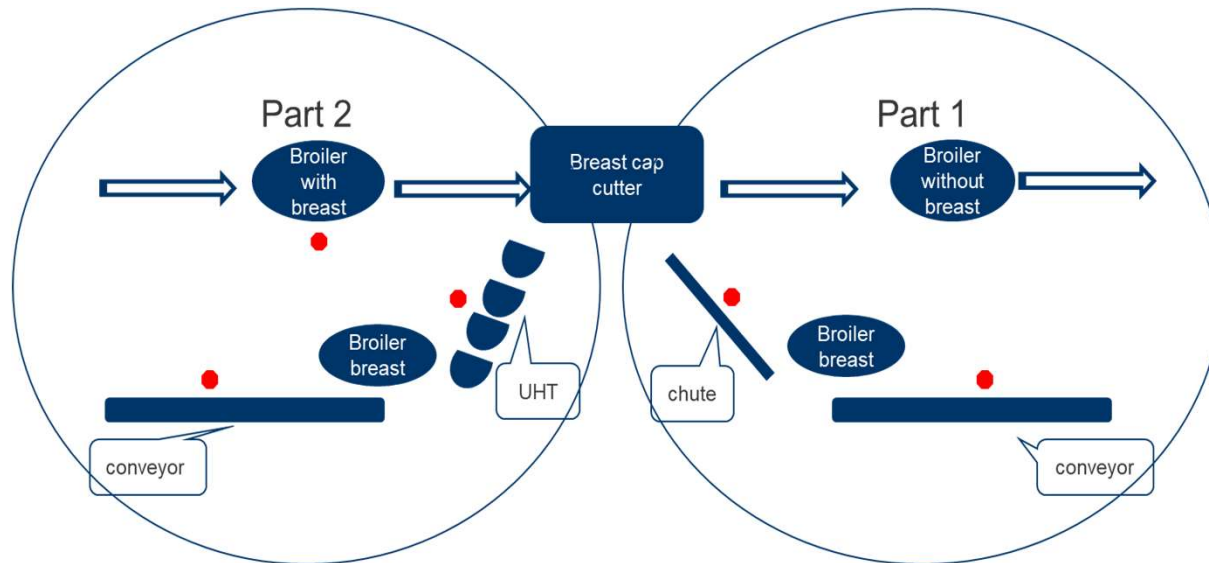
Significant measurable lower microbial life on belt surfaces behind an UHT.



Significant lower number of CFU (colony forming units) in the final poultry meat food product, if a UHT was used.



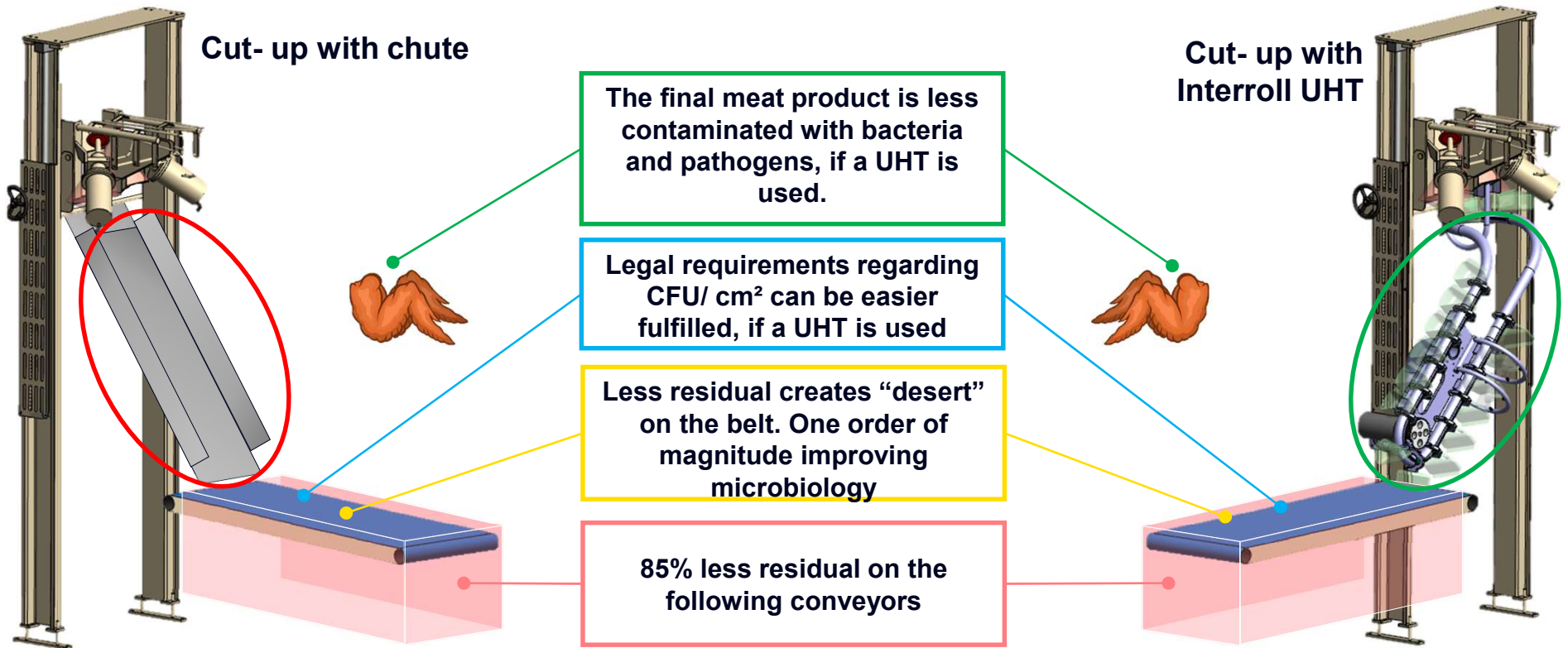
Ultra Hygienic Transfer Setup of second field test



- Major change for the second field test:
- Measurement of incoming meat quality
 - Split of one batch to run 50% UHT and 50% chute

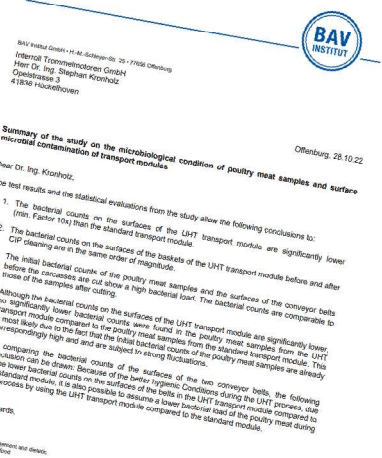
Ultra Hygienic Transfer

Summary of two field tests



Ultra Hygienic Transfer Proven Benefits UHT

- Stainless steel shoot is transporting significant more meat residuals through subsequent conveyors than UHT
➔ “Filter effect” of meat residuals for UHT **proven**
(matching in both field tests)
- By one order of magnitude UHT is improving microbiological level on the modular belt comparing to a belt with conventional cleaning ➔ **proven**
(matching in both field tests)
- Variation of incoming meat quality very high (two order of magnitudes).
The total microbiological process “contamination” is significantly reduced for meat running through the UHT process comparing to standard process.



Ultra Hygienic Transfer Business Case

Immediately less particles will contaminate the module bands

- Up to 85% less contaminated with visual debris (proven)
- Restructure of cleaning process will result in reduced cleaning effort, less water consumption, reduced electricity
- Savings of ~250+300€/per day

In the mid-term continuous product tracking

- Replacing the chute (bulk) by UHT (piece)
- Enabler for IoT/Industry 4.0
- Higher automation if one piece/carrier

In the long-term improved hygiene is a must have to
fulfill regulations (at least inside EU)

