ClassifEYE® Vision System

Whole bird quality grading to obtain continuous up- and downstream production optimisation

Accurate, fast and objective whole bird classification

Improve processing and optimise profits

The natural variability that occurs in the live bird intake challenges poultry processors when it comes to using each bird optimally and meeting customer orders. It takes a real-time classification system combined with complex software algorithms to ensure optimal bird distribution.

ClassifEYE® is an automated, in-line vision inspection system designed to grade the whole bird evaluating the sum of detected defects on each bird. Automatic defect detection at high processing speed ensures a consistent and objective quality determination. No human interface during classification is needed.

The ClassifEYE® system uses a weighted measuring scale of all defects detected on the whole bird according to defect thresholds set up in the system. The whole bird quality grade is used by our distribution software to determine best-suited distribution of each bird to downstream processes: whole bird packing, cut-up, deboning, retail and Food Service.

ClassifEYE® is also used to monitor increases in defects to adjust upstream processes immediately to reduce further defects and maximise each bird's value.

BAADER®
Food Processing Machinery

LINCO
FOOD SYSTEMS
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Our poultry vision

To be the first choice of poultry customers wanting **intelligent**, **sustainable**, **biosecure** and **leading animal welfare** solutions for **safe food** processing factories
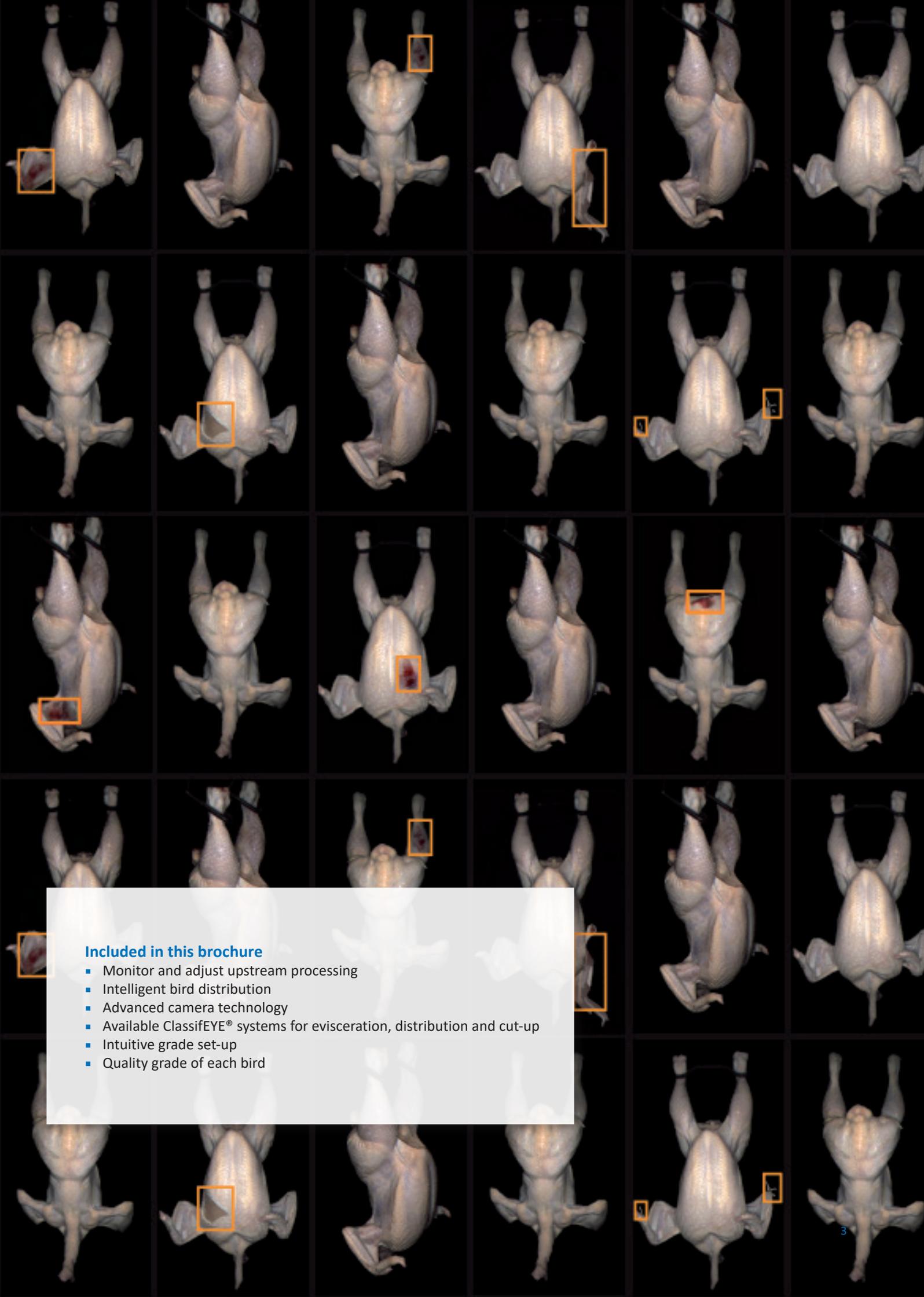
Included in this brochure
- Monitor and adjust upstream processing
- Intelligent bird distribution
- Advanced camera technology
- Available ClassifEYE® systems for evisceration, distribution and cut-up
- Intuitive grade set-up
- Quality grade of each bird

Monitor and adjust upstream processing

There is a reason for every defect

Monitoring defects closely allows for immediate upstream corrections. Immediate corrections lead to a fast reduction of carcass damages and fewer downgrades.

The ClassifEYE® whole bird classification software offers damage statistics for the last 1,000 birds, and allows the user to monitor the injuries and defects caused in previous processes. Live statistics can show:

- Overview of incoming bird quality for adjustments in quality grade parameters to ensure order fulfilment.
- Empty shackles: investigate line utilisation, downtime or transfer efficiency. Lost shackles are lost earning opportunities.
- Too many one-leg-hangers: adjust transfer machine and reduce costly and unhygienic rehandling.
- Rise in a specific damage type: adjust upstream processes and increase profits. See the type of defects that the system can detect on page 7.

The overview of daily production is available for a user-defined time period. Detection statistics per flock are automatically stored and can be observed in a report. The report shows bird count, whole bird grade distribution (percentage and count) and defect count.
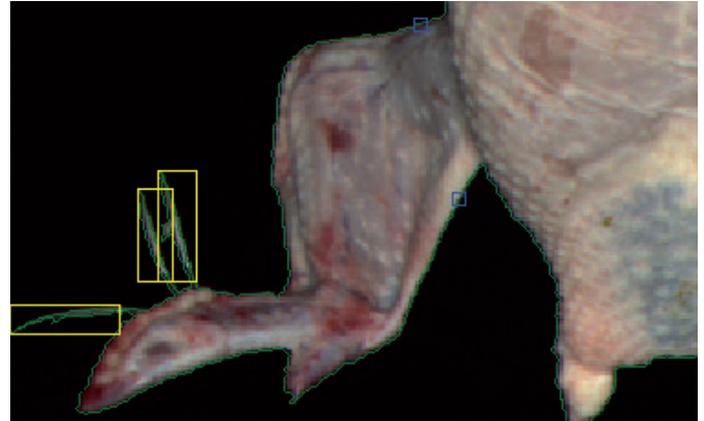
An unexpected rise in detected feathers on wings should lead to an additional check of scalding and picking adjustments
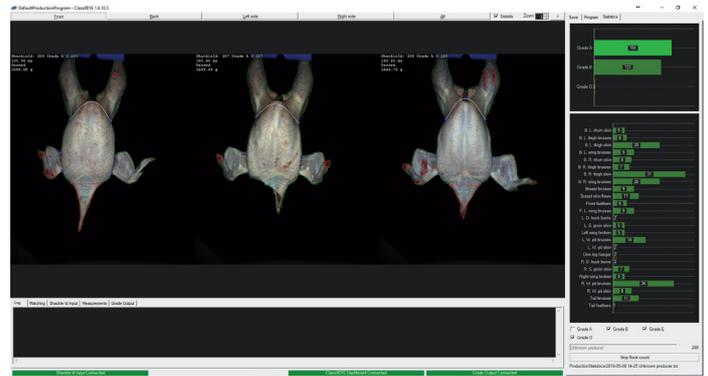
On the ClassifEYE® PC, the images captured on the shop floor are shown in a live view with statistics to the right.

Upstream adjustments

ClassifEYE® defect detection
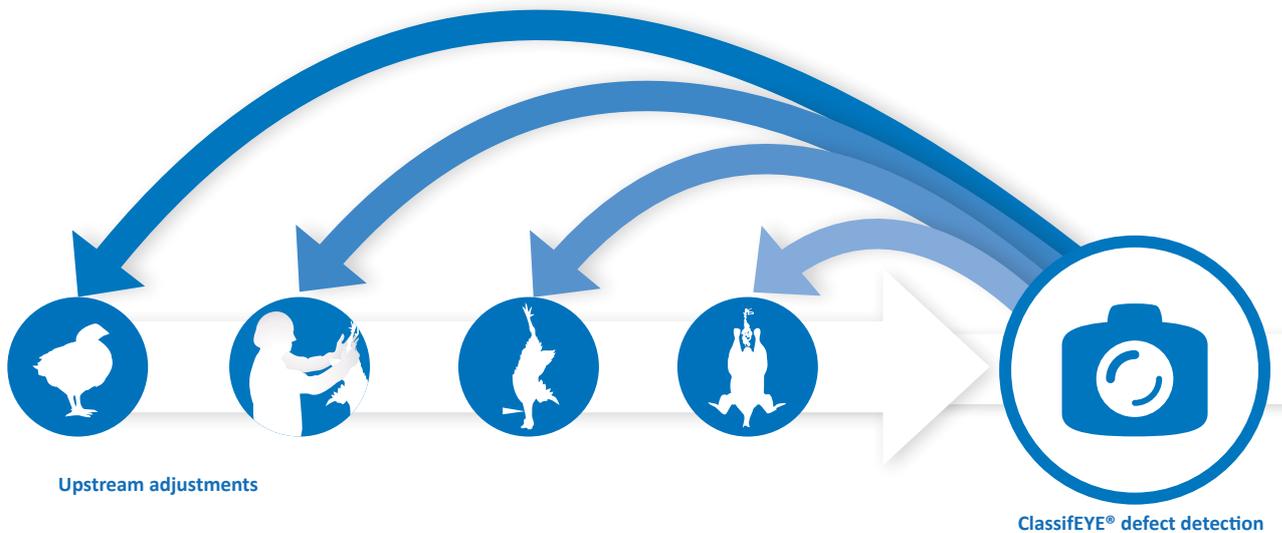
Intelligent downstream bird distribution

Best use of each bird

In a modern poultry plant, each bird can be processed in many ways depending on market needs. Sales orders place great demands on production planning to optimise the use of each bird and satisfy customers. Therefore, it is a necessity to know each bird's characteristics and distribute accordingly.

Supplying multiple markets

The ClassifEYE® vision system integrates with our distribution software to guide the whole bird through further processes and ensure best use of birds to supply multiple markets.

By integrating our Weigh Transfer 520 and ClassifEYE® vision system into the processing line, valuable weight and quality information is obtained about the whole bird and associated parts. Weight and quality classification can be used to distribute each bird to downstream processes: whole bird packing, standard cut-up, deboning or Food Service. It allows for best use of each bird and it allows a single line processor to supply multiple markets.
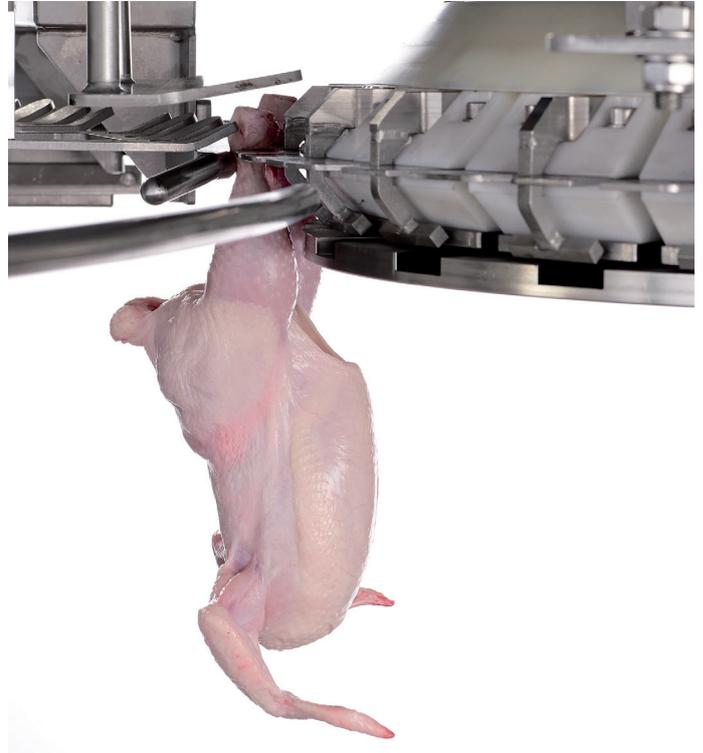
The combination of whole bird grade and weight detection is the very basis for an optimised use of each bird to downstream processes

Food Service

Standard cut-up and deboning

Downstream distribution

Whole bird packing
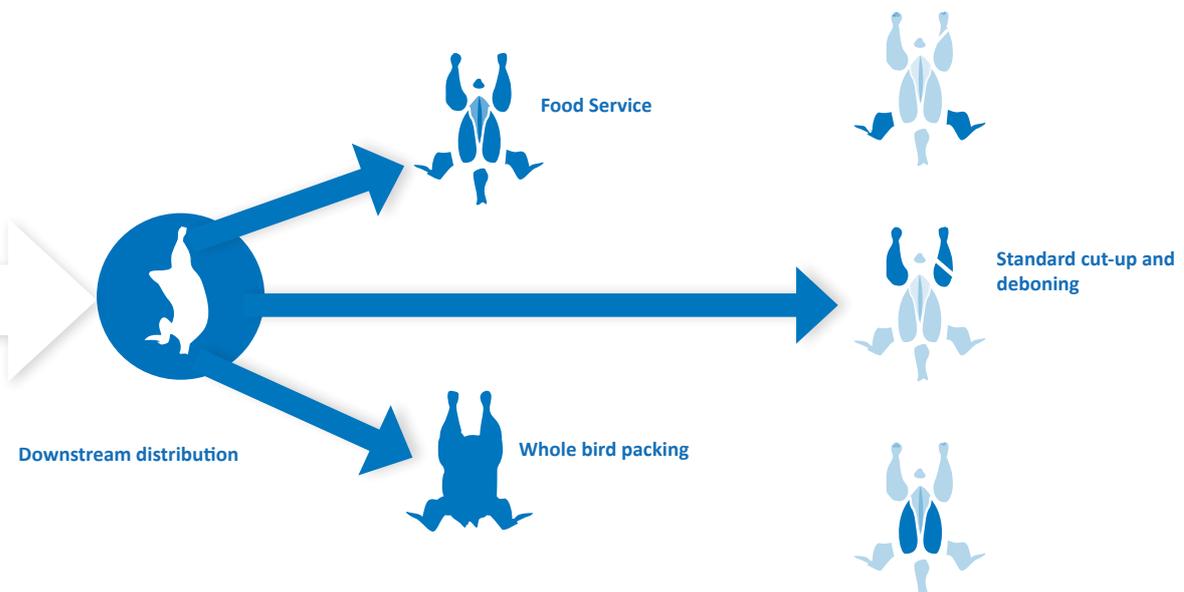
Advanced camera technology

Image processing in real time

The ClassifEYE® works by recognising colour, texture and shape variations on the bird. In order to obtain a high recognition certainty, the vision system is equipped with digital colour cameras capturing quality images even during high speed processing.

Careful lightning of the bird being inspected is ensured by LED flash lights. LED lightning offers long life, low power consumption and no variations in lux.

The ClassifEYE® can be integrated with our 180° spacing wheel or our nose-dip spacing module to ensure a correct spacing of the birds so the camera captures a single image without overlap.

The ClassifEYE® vision system is equipped with one, two or four cameras (see configurations on page 8). The number of applied cameras depends on the detail demands required for defect detections.
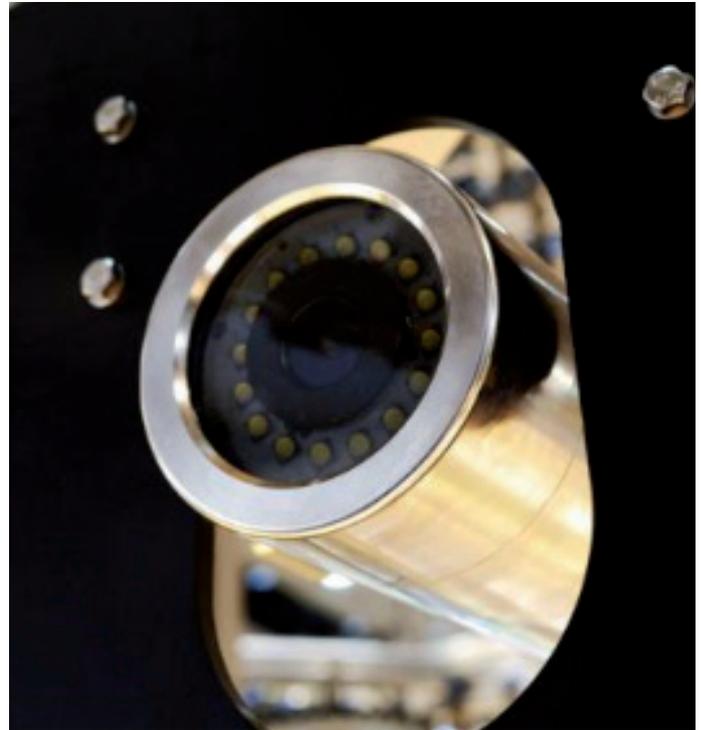
Industrial GigE colour camera 9 mm for high image quality

Full insight with four cameras - no blind spots

Once a mechanical separation of the birds has been made and the cameras have free access to each bird's surface, our four-camera solution provides you with a 360° view of bird quality.

The two side cameras will detect wing pit bruises and injuries on both sides of the bird and prevent blind spots during defect detection. As shown in the example below this text, the front and back camera show the bird to be A-grade. There seems to be no visible defects. However, a severe skin damage is clearly detected on one of the side cameras. A four-camera system prevents incorrect quality grading and thus inappropriate production and dissatisfied customers.

Back camera

Front camera

Side camera left
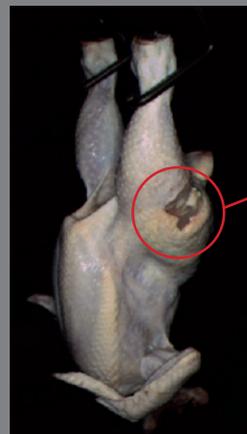
Side camera right

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Severe skin injury undetectable on a two-camera system.

Detectable defects to determine whole bird grade

Whole bird grading

The system is designed to grade the whole bird evaluating the sum of detected defects according to the thresholds set up in the Grade Setup (see page 10). The detection sensibility varies according to the threshold values. The illustration below shows the defects that the system is able to detect.

Grading accuracy

Grading accuracy is dependent on the camera seeing the defect and collecting an image of the defect that can be processed. If wings are folded or overlapping, this may cause a false negative classification, where a bird with a defect that cannot be detected by the camera is classified as a defect-free bird. Feathers will only be detected when sticking out from the carcass.

Back drum
Bruises
Skin flaws
Hock burns

Tail
Bruises
Feathers

Back thigh
Bruises
Skin flaws

Back
Bile

Wing shoulder joint
Bruises

Front drum
Bruises
Skin flaws
Hock burns
Feathers

Breast
Bruises
Skin flaws
Feathers
Breast burns

Front wing
Bruises
Feathers
Broken wings

Left/right groin
Skin flaws

Left/right wing pit
Bruises
Skin flaws
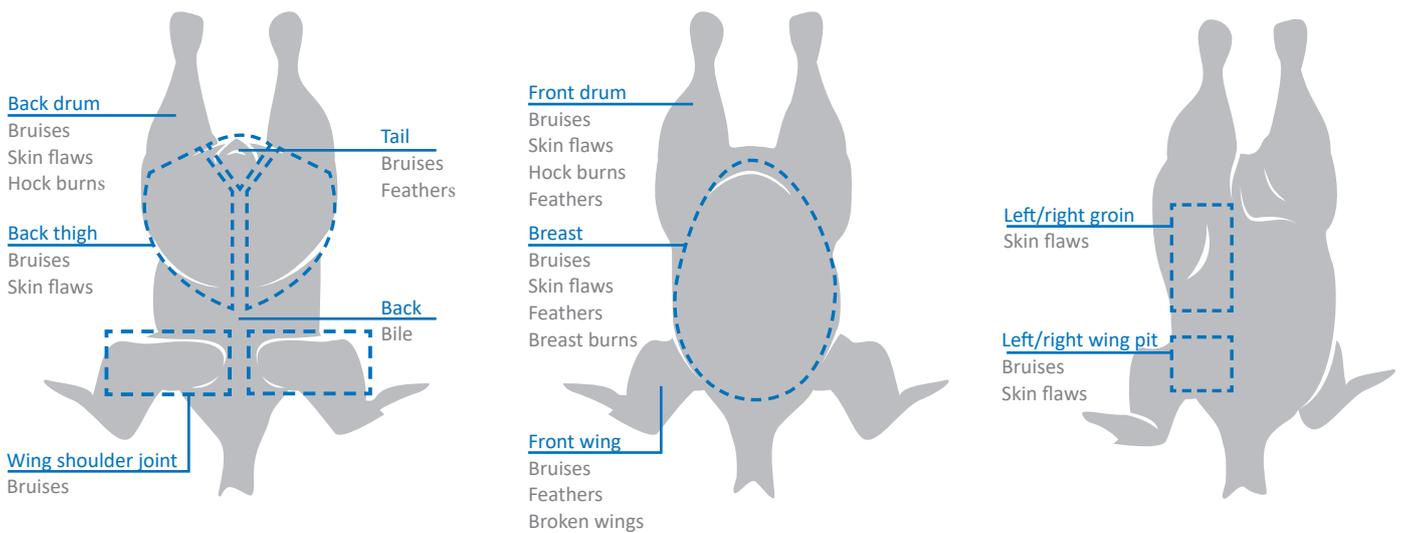
Also detectable: one-leg-hangers and empty shackles.

Available ClassifEYE® systems for evisceration, distribution and cut-up

The ClassifEYE® vision system is offered in various configurations to be placed strategically in the poultry plant. The sooner the ClassifEYE® is integrated in processing, the earlier the information is available for production planning and processing adjustments.

Quality grade on the evisceration line

ClassifEYE® 7040 is a circular classification system for the evisceration line. The system is equipped with two cameras for monitoring breast and back of the bird. The circular 180° bird spacing wheel is driven from the overhead conveyor and ensures that wings do not overlap.

- Two cameras: monitoring breast and back

The early location of the ClassifEYE® 7040 on the production line provides the processor with a couple of hours to plan downstream processing activities. Upstream adjustments are more immediate as the need for adjustments are detected before chilling.
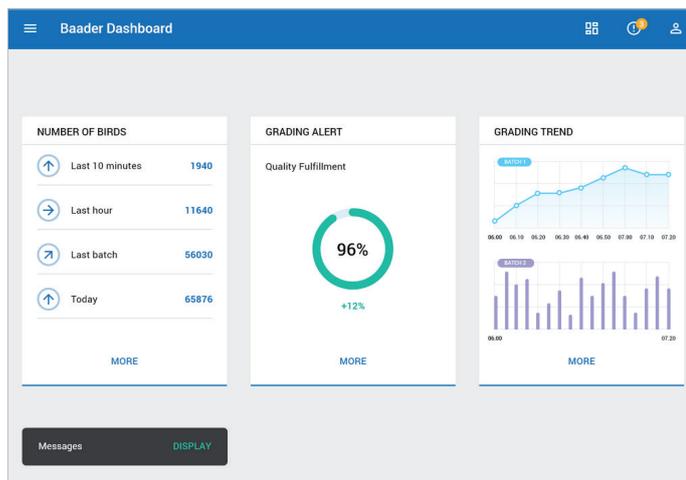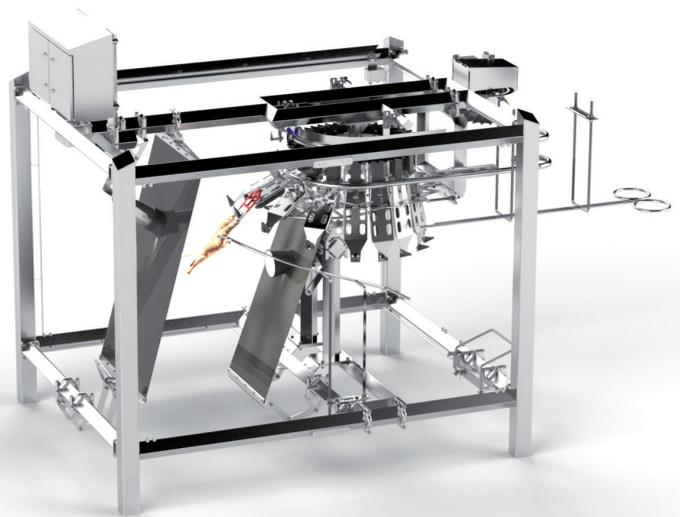
Under development: dashboard solution to keep the processor informed about production progress and grade detection

Quality grade on the distribution line

ClassifEYE® 7035 (models 210/220/240) is a "nose-dip" classification system for 8" distribution lines (cooling shackles with fixed suspension). The system is equipped with either one, two or four cameras depending on model. The vertical bird spacing wheel is driven from the overhead conveyor.

- Model 210 with one camera: monitoring breast
- Model 220 with two cameras: monitoring breast and back
- Model 240 with four cameras: monitoring breast, back and left/right side
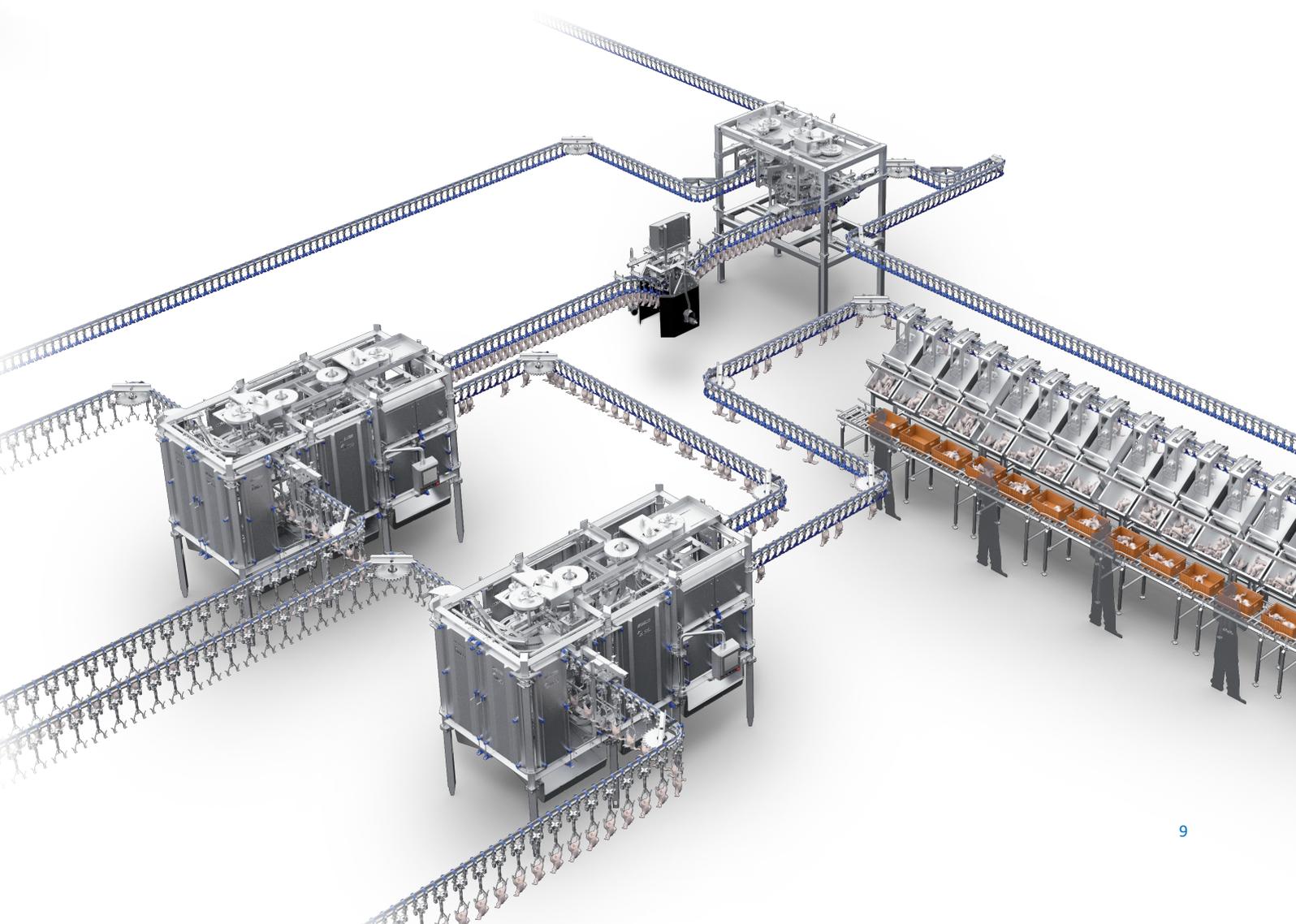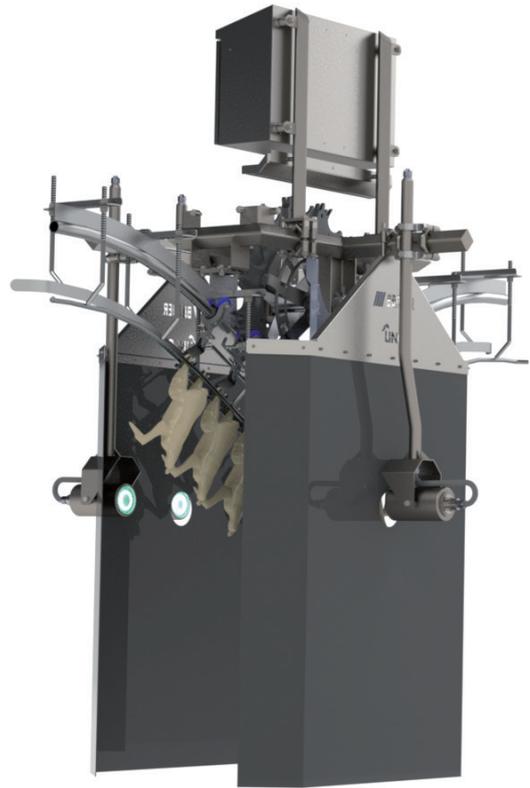
Intuitive grade set-up

Slide to select

The ClassiEYE® determines the grade of each bird according to the Grade Setup carried out on a ClassifEYE® PC. The set-up is as simple as moving a slider between photos showing different degrees of damages. Once the thresholds are set up, the system will use the weighted sum of the detected defects on each bird to determine its classification. Different thresholds can be set for different markets.

Each grade contains a set of criteria for the types of defects that the system inspects for. Criteria are grouped by parts. The user can easily combine the different part-specific defects to whole bird grade types. This system allows up to 20 different grades.

After set-up, our distribution software distributes the birds accordingly, taking order planning into consideration.

The sliders are positioned to the accepted defect threshold in order to determine the acceptable quality grade on each defect type. Different colours are used for each grade to easily monitor thresholds.

Quality grade of each bird
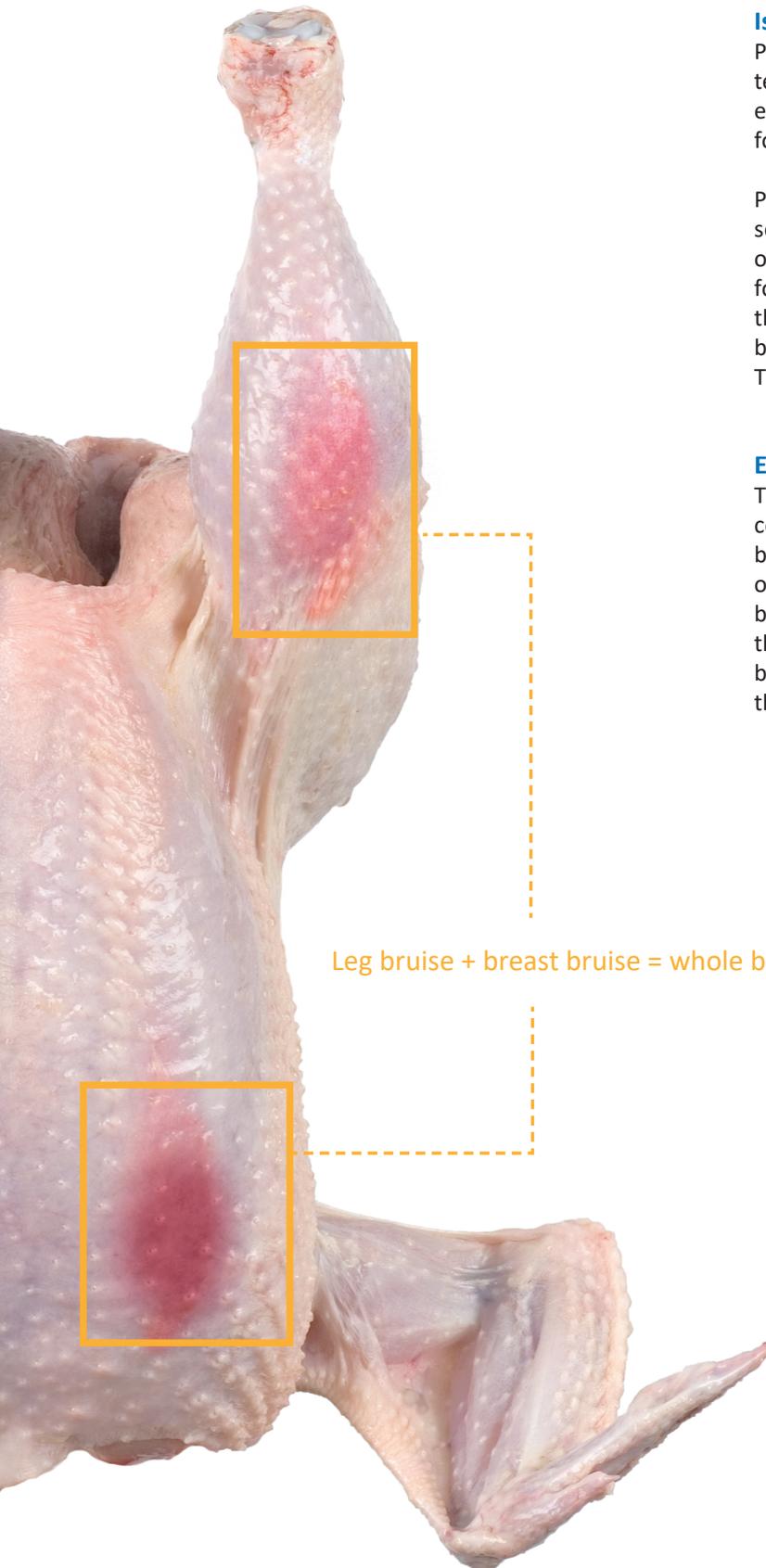
Leg bruise + breast bruise = whole bird to cut-up

Is grade A always grade A?

Production recipes can be created and saved with a descriptive text for different production planning. That means that different production plans would accept different degrees of defects for different grade types.

Pre-defined production recipes make it fast, easy and safe to set up the quality grade detection. In the screenshot example on the previous page, the user has defined different recipes for big and small birds. As it can be seen on the screenshot on the previous page, the program for ‚Big Birds' accepts smaller bruises on breast and thigh, but no bruises on drums and wings. These birds would be assigned to cut-up.

Evaluation process

The product passing the cameras is first evaluated by overall conditions: is the shackle empty or does it contain a bird? If a bird is detected, it is determined whether the bird is hanging in one leg. If the bird is properly hung by both legs, it is evaluated by the defined criteria to what whole bird grade to assign it. If the bird does not meet the criteria of any of the grades, it will be assigned to the 'Rejected by all grades' grade as defined in the set-up.

ClassifEYE® |Vision system
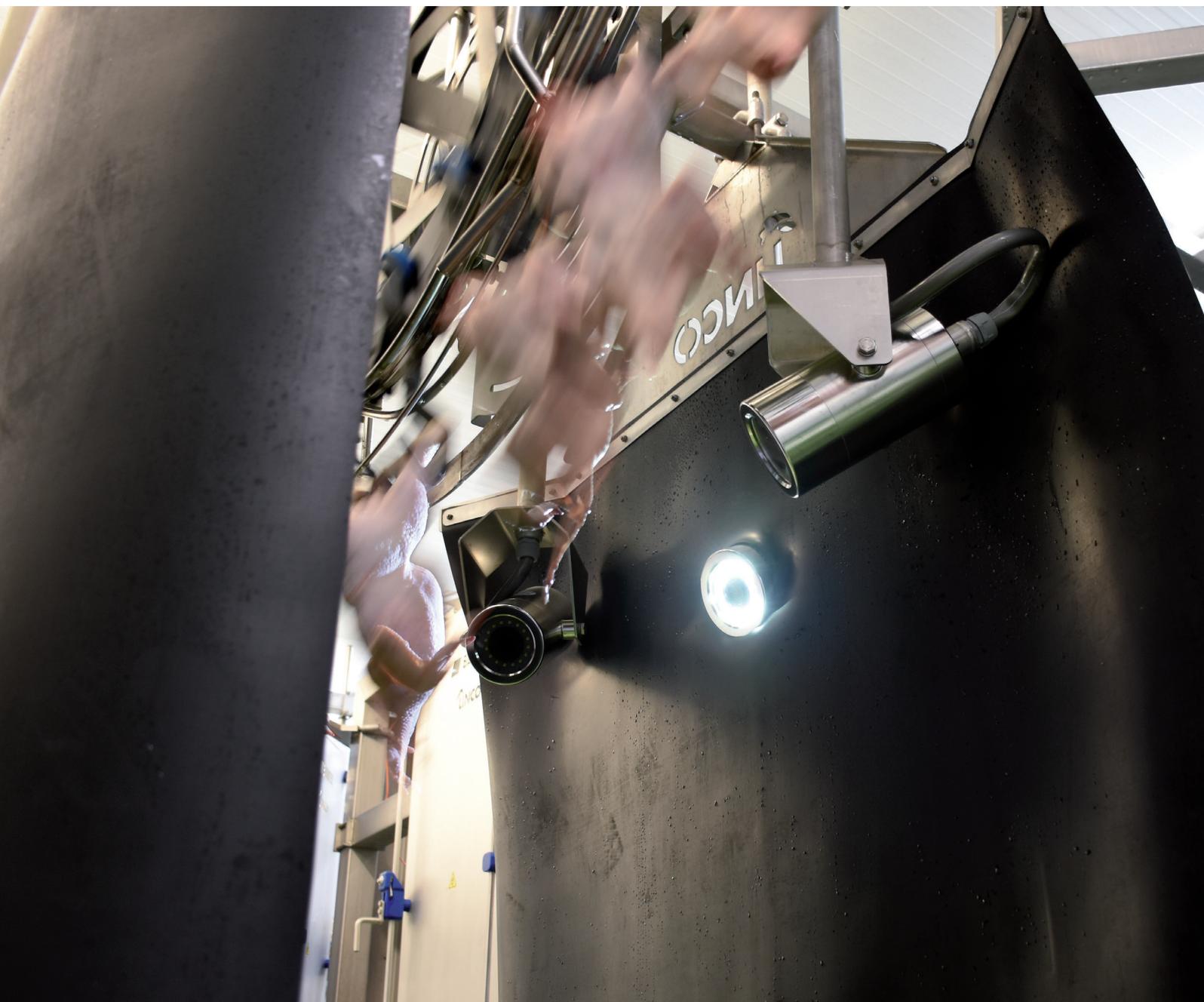
This brochure is current as from the publication date and supersedes all previous versions. The English version is perceived as the master document and all other versions are subject to incorrect translation. The indicated limits of the working ranges and performances may vary as a function of the proportion, quality and nutritional conditions of the birds. In order to achieve an optimal result, it is recommended to adjust the machine within the working ranges of the bird sizes mainly to be processed. Illustrations and dimensions are approximate and not binding. Subject to design changes in the interest of technical progress. Actual scope of supply is specified in our quotations and order confirmations and may differ from descriptions and photos of this brochure.

Attention! For the illustration of the technical details the safety devices and protection mechanisms are partly not shown in operative condition. When operating the machine, all corresponding devices and instructions referring to the safety of the machine are to be utilised and/or observed.