



Poultry Vision

Far Beyond EC1099

‘Head-only’ electrical stunner

*Independently tested by Wageningen University
(Gerritzen et al., 2015)*

*‘Head-only’ electrical stunning, the only legally
accepted means of **reversible stunning***



Poultry Processing Innovators

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Poultry Vision



Dutch Vision
solutions™

Poultry Vision

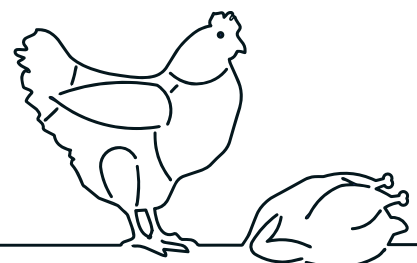
Far Beyond EC1099

‘Head-only’ electrical stunner



© 2010 by Dutch Vision © 2009 by Dutch Vision

Halal accepted
reversible stunning



Poultry Vision *Far Beyond EC1099*



Bird positioning



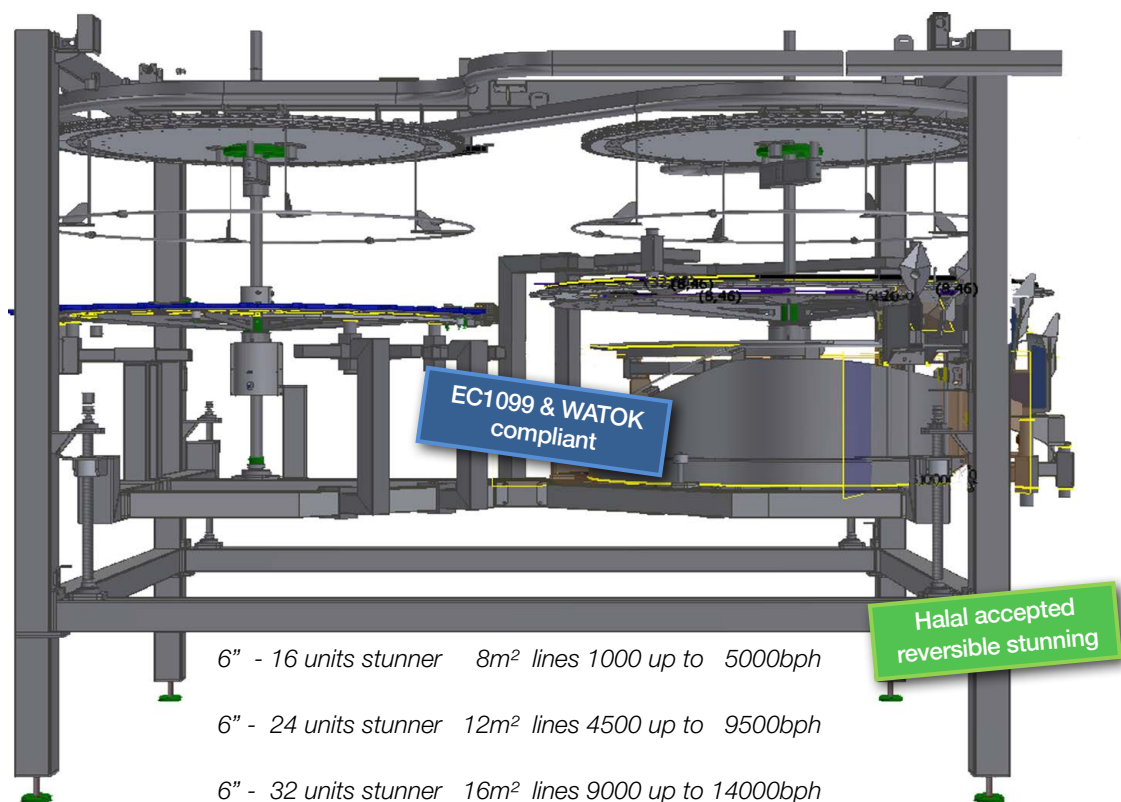
Head positioning



Stunning wheel



Stunned product



Straight forward sturdy design

Your maintenance staff will have a field day maintaining the Dutch Vision solutions Head-only electrical stunner due to its straight forward sturdy design. Direct access to each part of the machine makes for easy maintenance when needed.

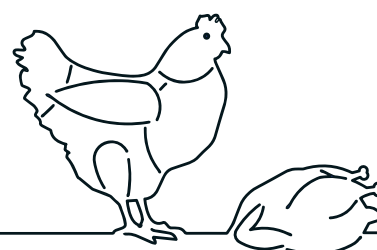
Low cost of ownership

Designed with a absolute minimum of moving parts in mind the overall cost of ownership will stay extremely low. One spring on the breast support, two on the wing lifter and one on the contact plate will keep replacement cost in check.

Easy to operate

With just one finger anyone can operate the Head-only electrical stunner. The height adjustment is motor driven so by the push of a button you can bring the stunner to the required position and that will be that. No other adjustments are to be made.

The Head-only electrical stunner will handle flock weights from under 2kg to above 3kg with a weight spread of 700gr within the flock.





Bird positioning



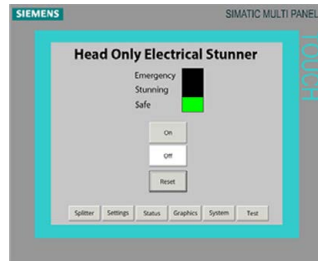
Head positioning



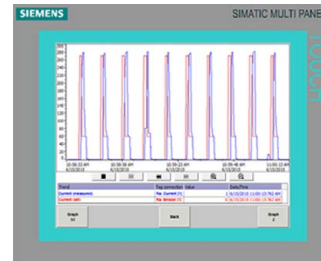
Stunning wheel



Stunned product



ON/Off-Screen



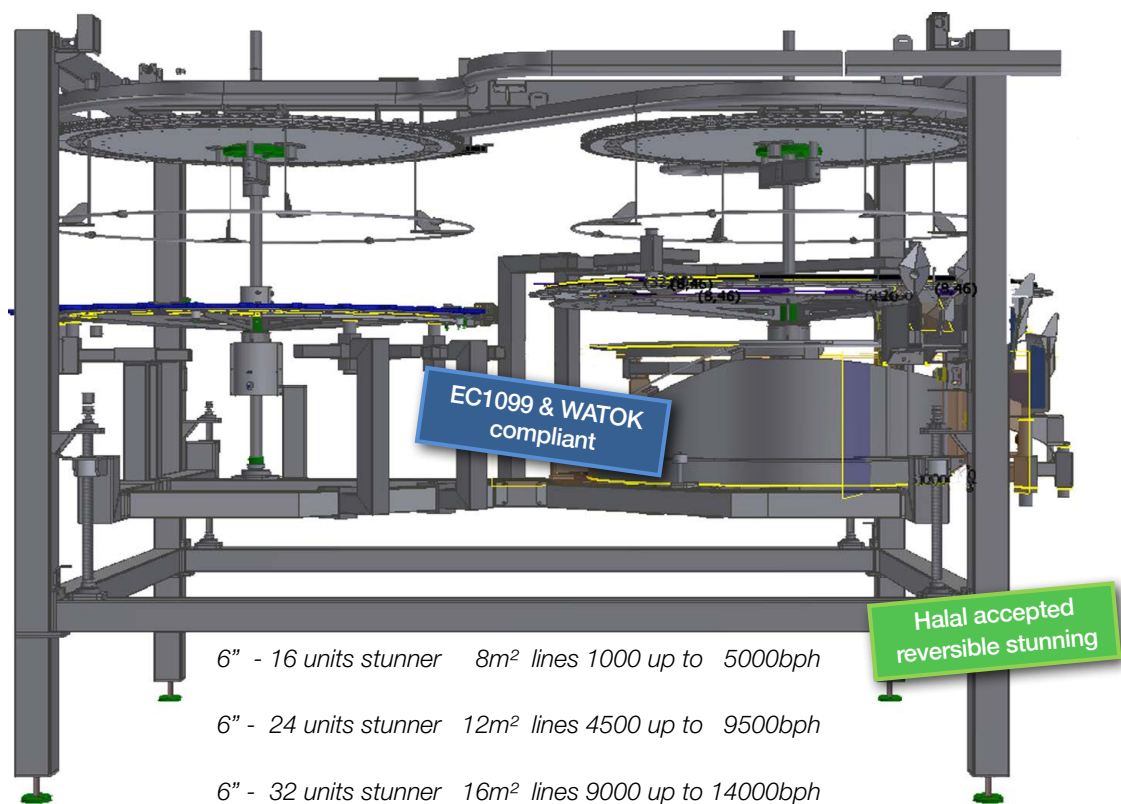
Graphic screen

Tip of a finger access to all features

Access all features of the Head-only electrical stunner through the intuitive interface with the state of the art touch screen for operator, QC & maintenance staff as well as your veterinarian. Alter operational settings, check sensors and look at the stunning results.

Crucial data logged on a local PC

All crucial parameters, as described in EU1099, will be stored on a local PC for future reference. Data can be stored with lot name and stable number but will always have a date and time stamp. As the stored file is a csv format it can easily be accessed with Excel.



**EC1099 & WATOK
compliant**

- ✓ **Far beyond EU1099/WATOK rules and legislation & EFSA opinions**
- ✓ **€ 00,01 per broiler less expensive than the CAS systems**
- ✓ **The only legally accepted reversible stunning to date**
- ✓ **Independently tested by the world renowned Wageningen University**
- ✓ **When fully automated well over 99% efficiency at 14000bph**
- ✓ **Applicable in lines varying from 1000 up to 14000bph**
- ✓ **Only 16m² floor space needed for a 'Head-only' stunner + 9000bph**
- ✓ **+ 30% improved product quality due to less B grade**

**Halal accepted
reversible stunning**

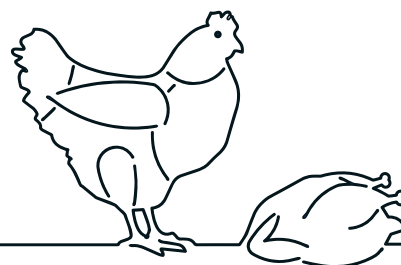
'Head-only' electrical stunning

Dutch Vision solutions from The Netherlands developed a new innovative electrical stunner for broilers which applies individual reversible anaesthesia to each bird and is in full compliance with the latest rules and legislations.

The 'Head-only' electrical stunner uses the resistance of the bird when applying a set milliampere guaranteeing an effective and reversible stun in full compliance with both EU1099/WATOK rules and legislations as well as with EFSA opinions.

'Head-only' electrical stunning is available for line speeds from 1000 up to 14000bph. Handles varying flock weights from less than 2kg to over 3kg with a weight spread, within the flock, of up to 700gr before adjustment is required.

'Head-only' stunning decreases the amount of B grade and/or dead product with a staggering 32.8% and it lifts your stunning accuracy up to an electrifying 96.4% when running at 13500bph! Combined with the Kill Line Shackle splitter this becomes an unprecedented 99.4%!



- Video links to YouTube -



Poultry Vision *Far Beyond EC1099*

'Head-only' electrical stunning Video - 1min. 54 sec.

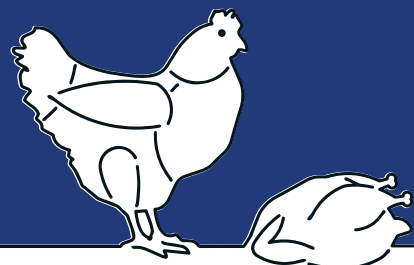


'Head-only' & KLS Splitter Video - 1min. 45 sec.



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- Electrical stunning - Science & research -



Poultry Vision
Far Beyond EC1099

Water bath stunning vs 'Head-only' electrical stunning Science, research and numbers

¹ Woolley (et al., 1986a,b) claimed that, under slaughterhouse conditions;

- 1/3 of birds are effectively stunned
- 1/3 are inadequately stunned and the remaining
- 1/3 undergo cardiac arrest

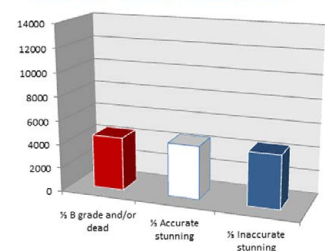
² Hindle (et al, 2010) states that variations in resistance can influence the quality of the stun to such a degree that some birds receive too much while others receive insufficient current. Ultimately, this can lead to problems with;

- animal welfare (failure to lose consciousness or rapid recovery)
- product quality (haemorrhaging, bone fractures)

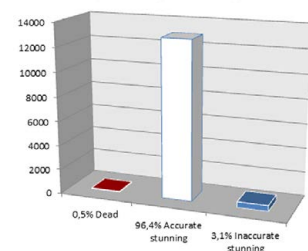
³ In Livestock Research Report 442 "Efficacy of the Dutch Vision 'Head-only' poultry stunner" Gerritzen (et al, 2015) tested, under slaughterhouse conditions at 13500bph, an efficiency of;

- **0.5%** dead product
- **96.4%** accurate stunning
- **3.1%** inaccurate stunning (missed birds, empty shackles)

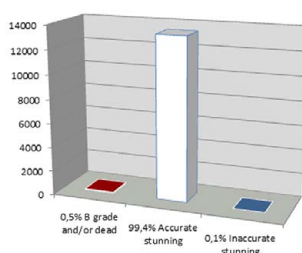
Water bath stunning efficiency totals ^{1 2}



Head Only stunning efficiency totals ³



Head Only, splitter & water bath totals

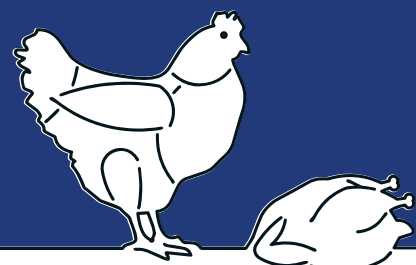


Dutch Vision solutions developed the Kill Line Shackle splitter to increase the amount of accurate stunning even further. The KLS splitter select all birds known to be stunned correctly and pushes them along the far side of a guide. Missed birds and/or empty shackles remain where they are and will be lead towards the installed water bath stunner.

Combining 'Head-only' & water bath stunning with the KLS splitter gives you a **unprecedented 99.4%** stunning accuracy at 14000bph!

Choose for reversible 'Head-only' electrical stunning with an accuracy of 99.4% and go far beyond EU1099 with an installed operational back-up stunner

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- 'Head-only' stunning - The numbers -



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Controlled Atmosphere Stunning vs 'Head-only' electrical stunning Science, research & the numbers

In December 2013 the European Commission presented to both Parliament and Counsel a report on various stunning methods for poultry.

The report compared the water bath, Controlled Atmosphere, 'Head-only' & Low Atmosphere Stunning and calculated which was the most cost effective way for stunning poultry.

It is no surprise that the use of a water bath is by far the most cost effective way but the stunning efficiency is extremely low which was the main reason for the implementation of EU1099.

Basis calculations for the cost of stunning with different methods for a throughput of 12.000 bph,

Cost factor	Water bath	CAS	Head-only	Vacuum stunning
Installation cost	€ 43000,-	€ 308300,-	€ 370000,-	€ 500000,-
Maintenance (% of installation cost)	3,45%	6,90%	3,00%	2,40%
Labour (reception/hanging)	97 hpd	90 hpd	96 hpd	90 hpd
Water (stunning/cleaning)	9,0m ³ pd	3,5m ³ pd	0,96m ³ pd	3,5m ³ pd
Electricity	5,2 kwh pd	127,0 kwh pd	9,6 kwh pd	1136,0 kwh pd
Gas	-	3,1 tonnes pd	-	-
Labour (other)	3 hpd	5 hpd	0,5 hpd	5 hpd*
Cost per bird (EU average)	2,439 cents	3,495 cents	2,521 cents	2,641 cents

Differences at 6.000 bph				
	Install. cost slightly lower; water & labour costs lower; electricity usage app. the same	Install., water & electricity costs the same; labour & gas usage proportional lower; maintenance lower due to lower throughput	Install. cost slightly lower (€ 350k); labour & electricity cost reduced proportionally	Install. costs halved through removal of half the vacuum chambers (€ 250k); electricity & labour also reduced proportionally
Cost per bird (EU average)	2,541 cents	3,687 cents	2,716 cents	2,667 cents

Differences at 3.000 bph				
	Install. cost slightly lower; water & labour costs lower; electricity usage app. the same	Install., water & electricity costs the same; labour & gas costs proportional lower; maintenance lower	Install. Cost as per 6.000 bph (€ 350k); labour & electricity cost reduced proportionally	Install. & electricity as for 6.000 bph; labour reduced proportionally
Cost per bird (EU average)	2,584 cents	4,053 cents	3,121 cents	3,087 cents

For both small & medium processing the above mentioned pricing of € 350K for 'Head-only' electrical stunning is incorrect. Please contact us for latest the prices!

Choose for reversible 'Head-only' electrical stunning with an accuracy of 99.4%, safe € 0,01 per chicken and move far beyond EU1099

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Brussels,
19.12.2013

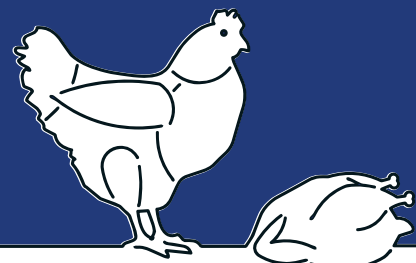
COM (2013)
915 final

Report from the Commission to the European Parliament and the Counsel on various stunning methods for poultry.

In the calculations for the 'Head-only' electrical stunner the Commission based there pricing solely on the on the information that, our former competitor, TopKip provided.

In reality the installation costs for 'Head-only' electrical stunning will be up and around those of CAS stunning for a stunner suitable for 14000 bph.

Due to there size and pricing CAS and Vacuum systems can't be viable operated by small and medium processors where Head-only electrical stunners can!

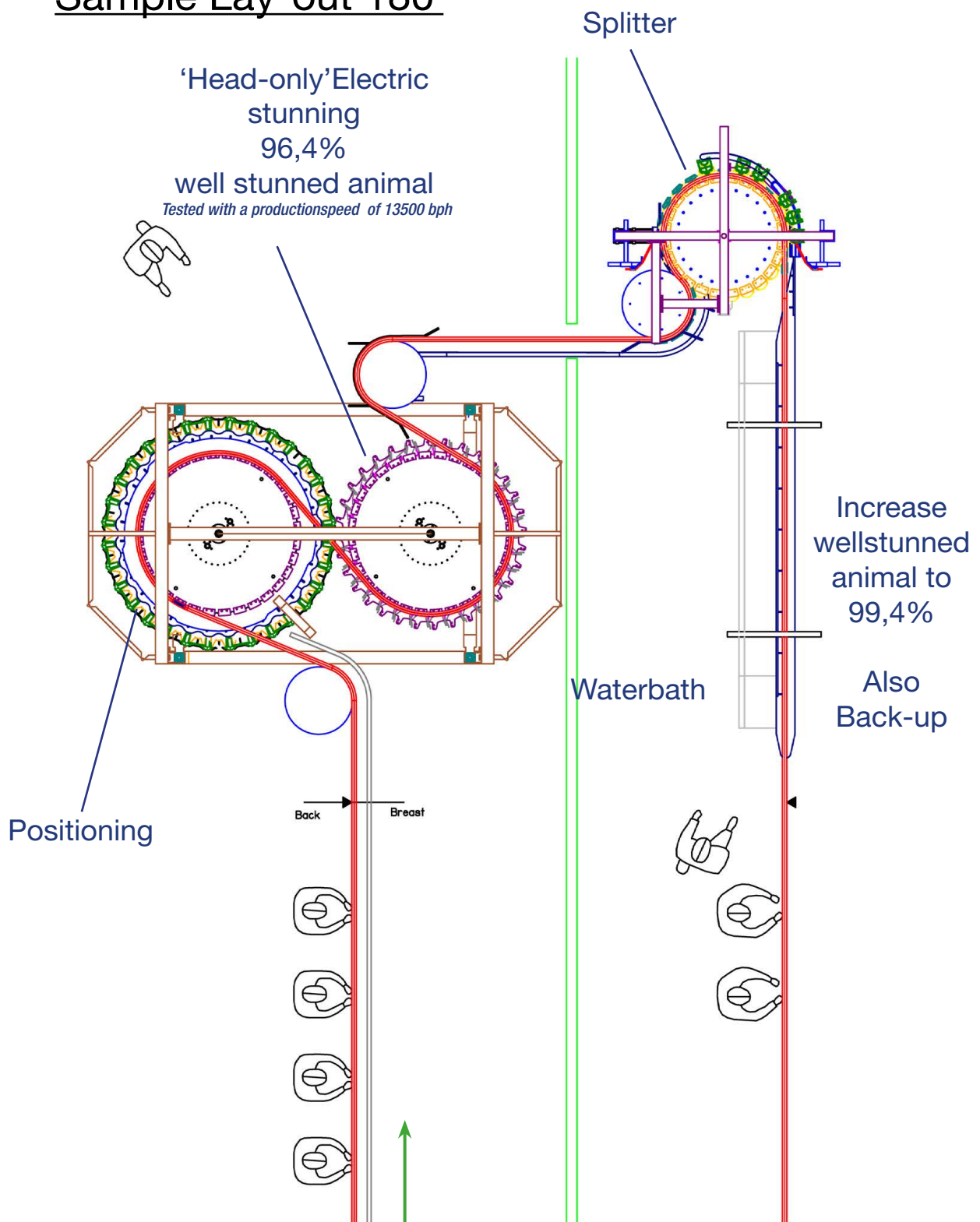


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'Head-only' electrical stunner & Splitter

Sample Lay-out 180°



Dutch Vision Solutions

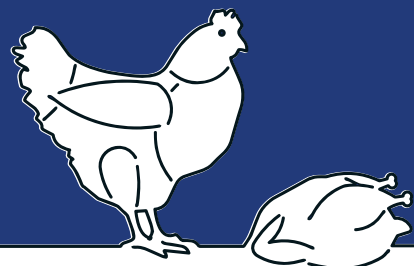
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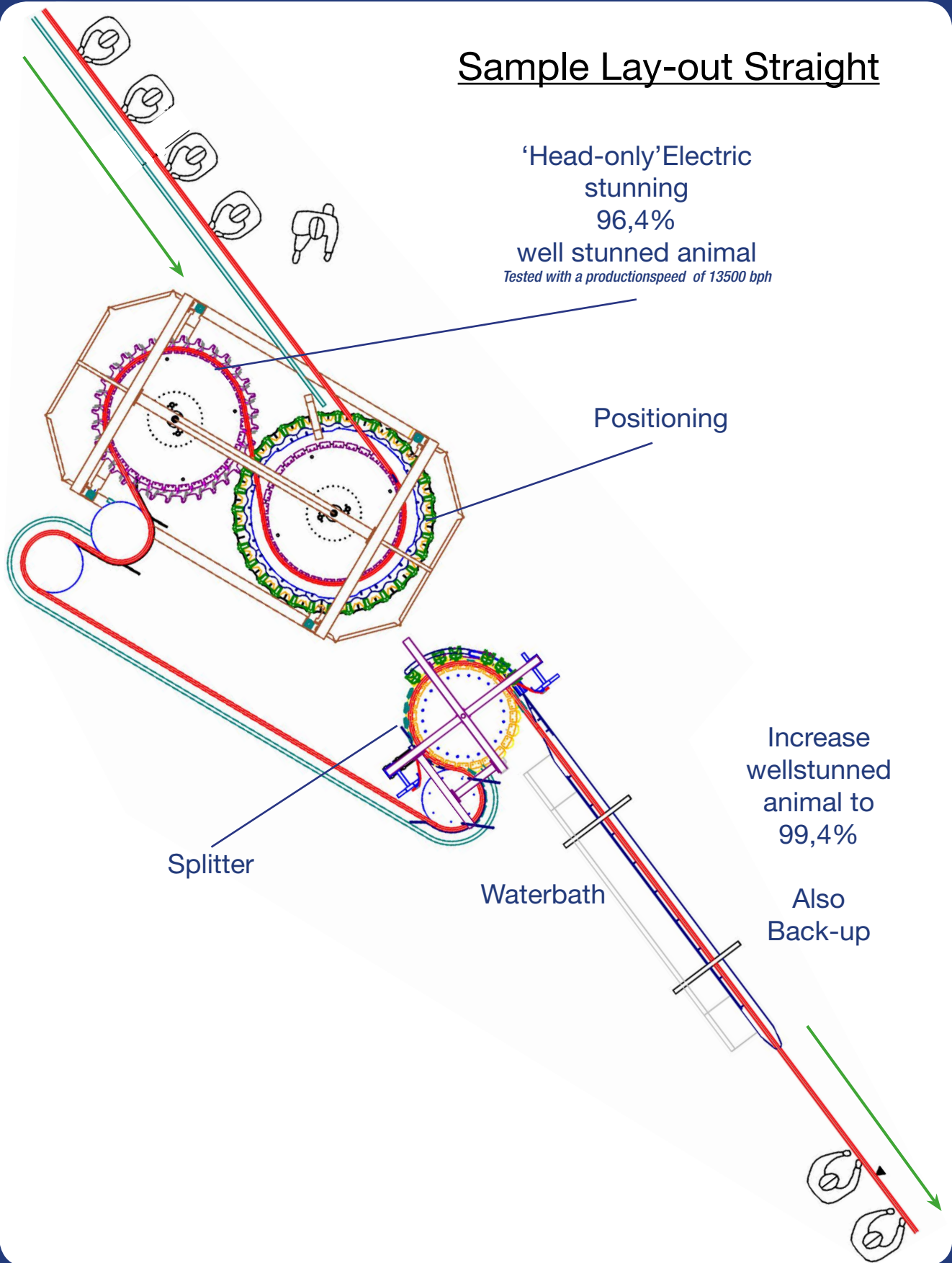
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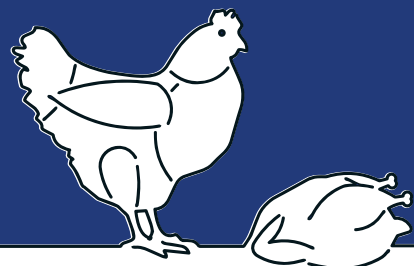
'Head-only' electrical stunner & Splitter

Sample Lay-out Straight

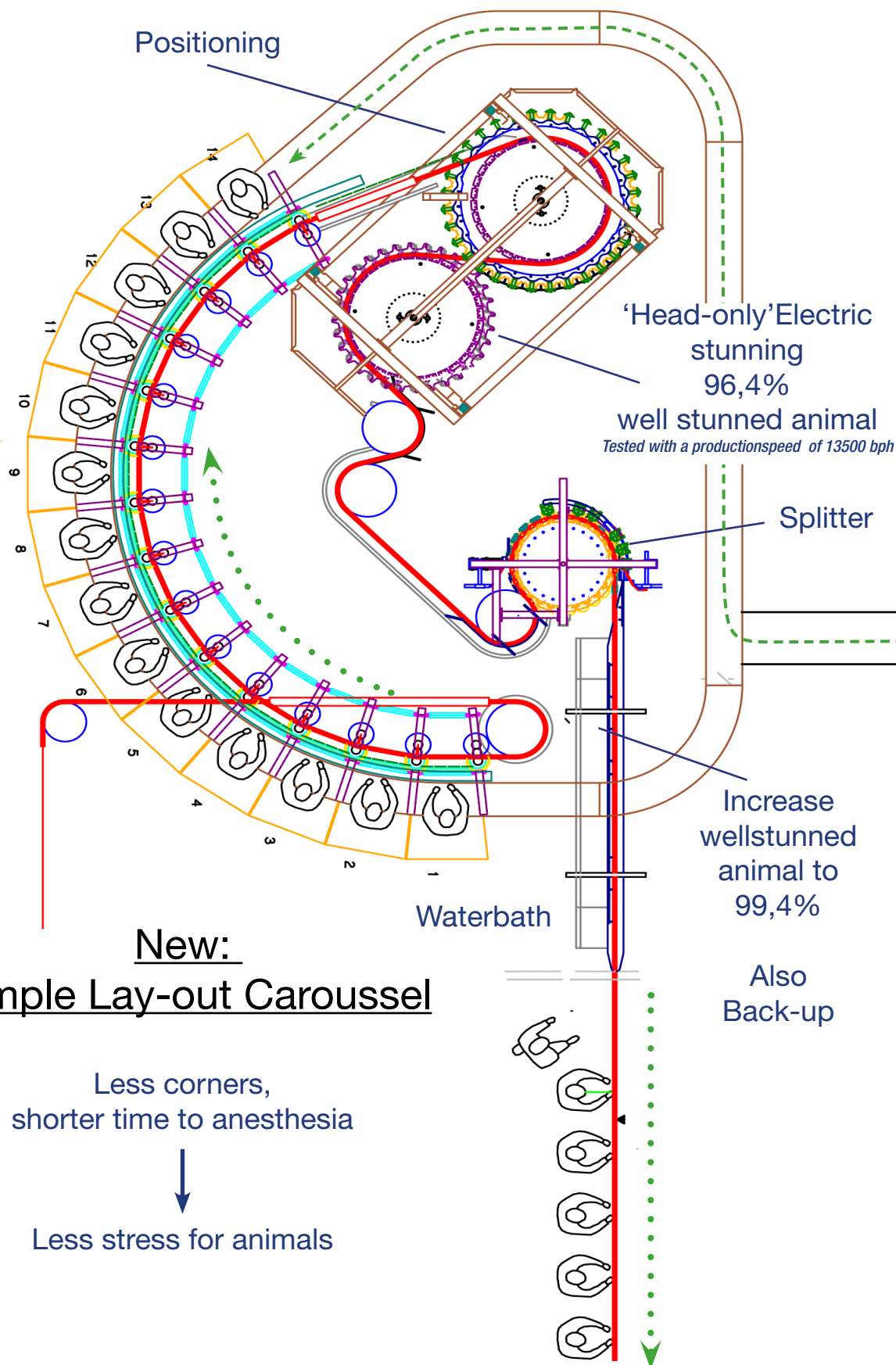


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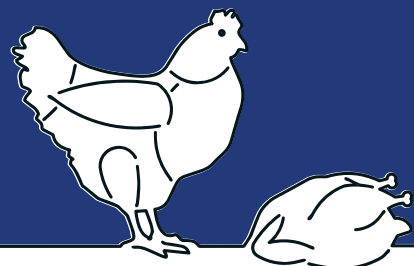
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Head-only stunning offers alternative to gas

Many consider water bath or controlled atmosphere stunning to be the two best choices when choosing ways to render poultry unconscious before a more welfare-friendly kill. But one Dutch company is marketing an alternative, stunning poultry by the head individually.

By Jake Davies

European poultry processors have trended towards using controlled atmosphere stunning and away from using water baths for a number of years, and in some ways it's easy to see why. Birds are not handled before stunning in such systems, making their final moments less stressful – and the process is less stressful for employees as well, who only deal with unconscious livestock.

Conventional water bath stunning has been considered by some to be of lower welfare for some time – one piece of research has suggested that just a third of broilers passing through are effectively stunned. Whatever the exact figure, running a current through water to stun multiple birds is not an exact science. Doing so creates a 'parallel pathway of resistance', and understanding which birds have been effectively stunned before slaughter is in no way easy. All the more challenging was the European Union introducing new legislation (1099/2009 Watok), setting higher parameters for stunning poultry before slaughter.

Halal challenges

While this move was welcomed by some, for Halal producers it proved a potential challenge – the new parameters were too high for birds to recover effectively. Gas stunning is also out of the question, as it also delivers a stun animals will never recover from. In Western Europe it is common for poultry to be 'recoverably stunned' before slaughter – acceptable to many who follow Islam in this region; it is a far smaller percent that choose only totally unstunned animals.



It was around 2009 that Michel Schmidt set up Dutch Vision Solutions, following a career in poultry processing. A contact concerned about the difficulties Halal producers faced got in touch, and asked him to develop a new machine that would allow poultry to be recoverably stunned using the new parameters. The answer, says Mr Schmidt, was individually stunning birds. "A high production capacity was important," he explains. "And I wanted a machine that could process up to 3kg live weight and at least 12,000 birds an hour." From that initial conversation, a machine capable of processing 13,500 birds an hour was produced. It is compatible with both six-and eight-inch lines, and the weight spread of a batch of broilers can be up to 700g before adjustment is needed. Furthermore, it has a footprint of 16 square meters – smaller than most controlled atmosphere stunning machines on the market. Testing has found it to be 96.5% accurate at full speed, but combined with a splitting device that diverts any unstunned birds to a conventional water bath, also devised by Dutch Vision Solutions, this goes up more than 99% accuracy.

Cost

Another key consideration, says Mr Schmidt, is cost (see table). He points to research undertaken by the European Commission as it was introducing its new stunning parameters that considered the cost of different stunning methods. Water bath stunning was least expensive, with gas stunning the most. In between was the head-only stun method, cheaper because of its lower maintenance and running costs, when compared with gas systems. While it was the difficulty that new legislation in Europe presented to halal processors that wanted a recoverable stun, Mr Schmidt says the resulting equipment is an improvement on water bath stunning, and comparable to gas devices. "Given the greater amount of A-grade product, the benefits are more than sufficient to cope with the more expensive price when compared with a water bath." "Blood spots are almost non-existent," he says. "And it's the same with major haemorrhaging around wing points."

Marketing

His head-only stunning system, built in the Netherlands, is now on the market, and orders are progressing with Dutch slaughterhouses. But it's the global market that Mr Schmidt ultimately has his eye on. In the US, he considers the growing trend towards higher welfare product as a potential opportunity. "In America, they don't have the 240mA limit. But, if you look at what's happening with animal welfare awareness, that might be a selling point." Another region is countries keen to import to Europe, such as Brazil, that have been caught out with the new WATOK regulations, and lost market as a result.

Finally, Mr Schmidt feels the trend to recoverably stun could spread to regions where it is currently not common, such as the Middle East. "We think that this is the best alternative to gas systems – nobody wants water bath stunning anymore, at least in the EU. We've proven with this machine that there is an option if you cannot use gas, either for halal reasons, or you don't have the space."

Wageningen research: Testing head-only stunning

Dutch Vision Solutions asked Wageningen University to review its stunning technology under lab conditions. The first step was to evaluate the machine's efficacy. Thirty-eight broilers were stunned by an electrical constant current set at 275mA for 1 second, followed by a current of 30mA for three seconds. It was considered these parameters delivered an effective stun. A second experiment was geared at understanding the machine's efficacy at commercial slaughterhouse conditions, to ensure that stunning renders birds unconscious and they remain so until slaughter.

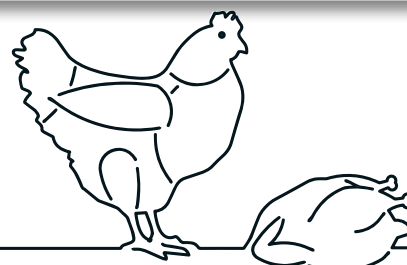
The experiment was conducted at 13,500 birds/hour to mimic normal operating conditions, and 200 birds over two days were assessed from seven different flocks. The stun was judged by reaction to stimuli. The study found more than 95% of birds were effectively stunned, with 4.5% showing some reaction 30 seconds post-stun. Based on these results, it was recommended that birds are killed no more than 30 seconds after stun. An in-line back-up system, such as the splitter device also developed by Dutch Vision Solutions, was also considered important.



A close up of the position the birds are manoeuvred in.

Basic cost comparison for different stun methods

Cost factor	Water bath	CAS	Head only	Vacuum stunning
Installation cost (euro)	43.000	308.300	370.000	500.000
Maintenance (% of install)	3,45%	6,90%	3,00%	2,40%
Labour (reception+hanging)	97 hpd	90 hpd	96 hpd	99 hpd
Water (stun+cleaning)	9,0 m3 pd	3,5 m3 pd	0,96m3 pd	3,5m3 pd
Electricity	5,2 kwh pd	127,0 kwh pd	9,6 kwh pd	1136,0 kwh pd
Gas		3,1 tonnes pd		
Labour (other)	3 hpd	5 hpd	0,5 hpd	5 hpd
Cost per bird (EU average)	2.439 cents	3.495 cents	2.521 cents	2.641 cents
Differences at 6000 birds/hour	2.541 cents	3.687 cents	2.716 cents	2.667 cents
Differences at 3000 birds/hour	2.584 cents	4.053 cents	3.121 cents	3.087 cents





GLOBAL STUNNING REVIEW

Most consumers make no correlation between cattle in a field and steaks on a barbeque. They don't realize that for milk on their cereal or cheese on their mac, dairy cows and goats need to be bred on a regular basis, leaving a surplus of males that no farmer can afford to keep. Turning chickens into broilers, pigs into pork, it all starts with a person and a stunner. MPJ's Technical Editor James Chappelow reports on the latest developments in the field of stunning

FARM ANIMALS BECOME MEAT products at the slaughterhouse. This truism is mirrored by another: consumers prefer not to know about this process. The strength of the childhood image of farming, so easily subject to anthropomorphism from Larry the Lamb to Shaun

the Sheep, has a lasting impact. The journey from farmyard to shop has become a taboo zone in the brain. Occasional qualms about animal welfare are eclipsed by the smell of bacon for breakfast or the prospect of roast beef for Sunday lunch.

Meat eating, be it for simple food in the pot or for extravagant celebrations, is at the core of many cultures around the world. Increasing urbanization and population growth have had an obvious impact on the demand for food of all types. The complete disconnect between town and country has led to growing ignorance about the production of food. It is no surprise to find that many children have no idea how bread is produced and think that fish fingers are made from chicken. The frequent

campaigns about animal welfare by a loudly vocal minorities continue to have only fleeting impacts on consumer choice and demand.

The attitude of the general public towards meat production was demonstrated in a 2015 survey by the European Commission. The "Study on information to consumers on the stunning of animals" was based on a sample of 500 respondents from each of the 27 EU countries. It was found that the main purchase criteria that were used were quality, presentation, durability, and price. Only 2% cited meat production methods as the most important criteria – 1% for religious reasons and 1% for animal welfare reasons. It was stated that "no respondents spontaneously mentioned animal welfare at slaughter as a purchase criteria". Only when prompted did consumers show an interest in knowing about stunning at the point of slaughter with 48% saying that they would read the labels if they were added to products.

This survey also elicited responses from those who run slaughterhouses across Europe. There was general agreement that details about methods of





stunning were only of concern “for a small number of relatively vocal consumers.” These stakeholders universally agreed that consumers have little notion as to the details of the slaughter process. Yet this does not mean that there would not be concern about the activities of the slaughterhouse. There is thought to be a high level of expectation that animal welfare is a major concern at slaughterhouses and consumers trust that the rules are kept to – without enquiring about the specific details of such rules. The stakeholders believe that “consumers frequently conflate religious slaughter with un-stunned slaughter, a misunderstanding not helped by the presentation of this issue in the media.”

The lack of public interest in the processes of slaughterhouses has not meant that they ignore the challenges of a changing world and the demands of ever tighter regulation. They are an integral part of the meat industry and are serviced by many well established companies that have an interest in the development of new and improved technologies. Over the past few years there has been a trend towards the survival of larger businesses at the expense of the smaller and ‘traditional’ slaughterhouses. Alongside this has been the steady expansion of regulations that are minimum standards across the globe as well as greater regulation and higher expectations within individual countries.

Slaughterhouses are big business. The slaughter totals in the USA in 2015 are staggering: over 29 million head of cattle, 115 million hogs, 2 million sheep and lambs and nearly 9 billion chickens. There are similarly high figures for the EU and other large meat producing countries. Given these large totals, it is not surprising that examples may be found that support the view that animal welfare issues do arise. Yet other priorities also need to be addressed. As in any other business, costs need to be taken into account as do the safety and conditions for work of the many thousands of employees in the industry. New equipment and new systems for efficient production need to be balanced with better, frequent and certified training for operatives. Similarly, the growing need to assimilate religious requirements for animal slaughter must be seen in the context of questions of animal welfare.

One significant motor for change has been the debate about stunning before slaughter. To some this is a straightforward matter of finding the most efficient and effective way to process animals in the slaughterhouse. It introduces questions about design, lairage, and the treatment of animals prior to slaughter as well as practical issues of safety and timing. Requirements for good record keeping at the point of stunning have been widely introduced and backed by legislation. Key animal welfare considerations have underpinned the

development so that in many countries including Australia, New Zealand and (within the EU) Sweden, Denmark, Malta, Poland, Slovenia and Lithuania killing without stunning has become illegal. A total of 11 EU countries did not perform slaughter without stunning in 2012. In the USA the Humane Slaughter Act requires that all larger animals are stunned before killing.

ROTATING PENS

BOTH THE KOSHER AND HALAL TRADITIONS (which are fully discussed in “Answer to a Higher Authority” in MPJ for January – February 2015 – Volume 2 Issue 1) are at odds with pre-slaughter stunning. It has become common to grant special exemptions from the law for the production of kosher meat, as in the UK the USA and Australia. Although in 2003 the UK Farm Animal Welfare Council (an independent advisory body) came out in favor of pre-stunning before slaughter the UK government decided in 2005 to allow the continuation of slaughter pre-stunning for Jewish and Muslim groups. In fact, Muslims have in some circumstances allowed stunning to be used provided it is reversible, and this solution has been widely applied – although not without religious dissent and debate. The concept of reversible stunning – a stun from which the animal will recover if not killed in an appropriate religious manner before that happens – has given companies the incentive to develop methods of stunning that would be deemed suitable.

A recent European Commission report “On systems restraining bovine animals by inversion or any unnatural position” (the BoRest study) investigated the prevalence of bovine slaughter without stunning in the EU. It found that of the 25 million bovine animals slaughtered in the EU in 2012 2.1 million (8.5%) were slaughtered without stunning. The BoRest study is largely a comparative investigation of the merits of upright restraining systems (Cincinnati pens) and rotating systems (the Weinberg pen). In 80% of cases, the rotating pens are used, none of which are in the UK, where they are not allowed.

In terms of religious requirements, Jewish communities were found always to prefer the inverted position provided by the rotated pens while Muslims found the upright position also to be acceptable. In terms of animal welfare, BoRest reported that the three major manufacturers of rotating pens, of the type produced by companies such as BANSS, had made many improvements to the design since the 2004 report by the European Food Safety Authority (EFSA). This meant that, “from the animal welfare point of view there are no conclusive findings that one system is better than the other.”





Above: Birds stunned by controlled atmospheric stunning (CAS)
Right: Marel CAS SmoothFlow

In addition, the BoRest enquiry on restraint was set in the context of the whole process of slaughter. It was evident that the principle causes of variation in slaughterhouse practice was not the equipment – which is upgraded and renewed over time – but the elements of cost and human behavior. While in many respects the picture is positive, with more training and better information from manufacturers, examples were still found where electric goads were used too frequently and more could be done to establish an atmosphere of calm.

The European Commission has also published a report, “On the various stunning methods for poultry”. In the EU two methods are well established: the multiple bird water-bath which stuns using electric current and Controlled Atmosphere Stunning (CAS) in an atmosphere chamber where birds are exposed to gas mixtures. In 2012 80% of broilers were stunned in a water-bath and 20% by CAS. Some problems with water-bath stunning were identified.

- 🐔 Inversion and shackling of birds is painful
- 🐔 The amount of current delivered to each bird varies and cannot be controlled.
- 🐔 Slaughterhouse operators tend to lower the current because of meat quality concerns.

ESFA has insisted that “water-bath stunning delivers up to 96% effective stunning” but it is also admitted that greater inspection is required. Overall,



water-bath stunning is cheaper except when the throughput is high when the cost of CAS is relatively lower. Variations in costing are dependent on differing labor costs across the EU. Research and development has led to steady improvements in CAS systems as at Marel Poultry which has been working on CO2 poultry stunning successfully for two decades.

LOW-COST WATER BATH

THERE IS NOW A GLOBAL MARKET FOR chicken meat and products with Brazil leading the way. Around 75% of poultry imported to the EU comes from Brazil where water-bath is the main method for stunning

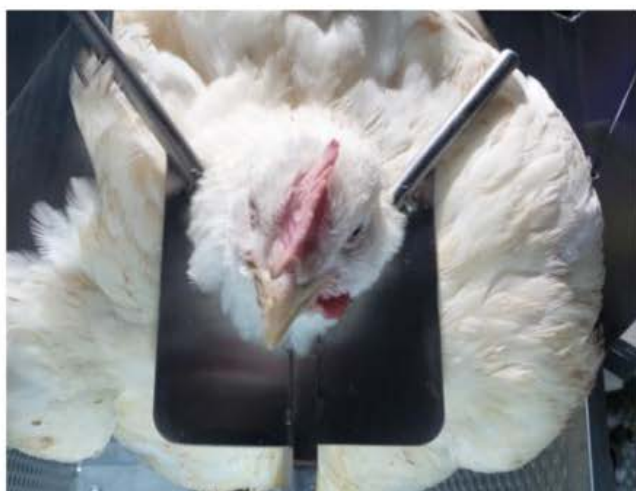
www.meatpacking.info



Meat Packing Journal | 19



DUTCH VISION SOLUTIONS



Above and left: Dutch Vision Solution's Head-Only Stunner

and competitiveness is maintained (as is the case with Thailand) through much lower wage costs as well as the availability of cheaper feed. The USA is unable to export to the EU because of the use of antimicrobial treatments but the USA also has lower costs than the EU and is a significant competitor in the global market. In these circumstances EU producers have sought to use methods that ensure higher quality, premium cuts for the market and consistency in color, with no blood splashes. The

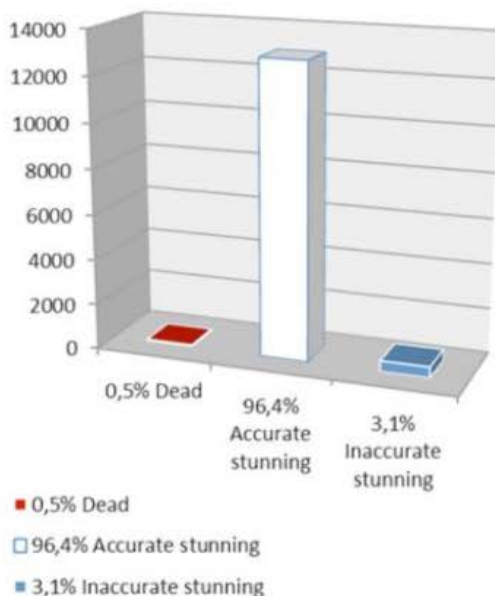
slaughter process should also minimize losses through trimming.

EU meat producers also demand products that meet specific animal welfare or religious requirements. For kosher poultry, no stunning is allowed. Jewish butchers claim that by the very nature of the cut that is made the bird will instantly be rendered insensible. For halal poultry, reversible stunning is required which rules out the use of CAS. Water-baths may be set up within parameters that allow for reversible stunning but this can lower the percentage of animals that are properly stunned. There is less agreement about the further steps in the process, however, as the use of mechanical knives to cut the necks of the birds may not be halal. The finer points of Muslim theology are brought into this ongoing debate.

Head-only electrical stunning for poultry has now become a commercial possibility as it is possible to stun between 9,000 and 14,000 chickens per hour. This system has been developed by Dutch Vision Solutions and validated by Wageningen University Livestock Research Department, which stated that "Head-Only Electrical Stunning is the best possible means of stunning to date". The whole process is in line with



Head only stunning efficiency at 13500bph totals

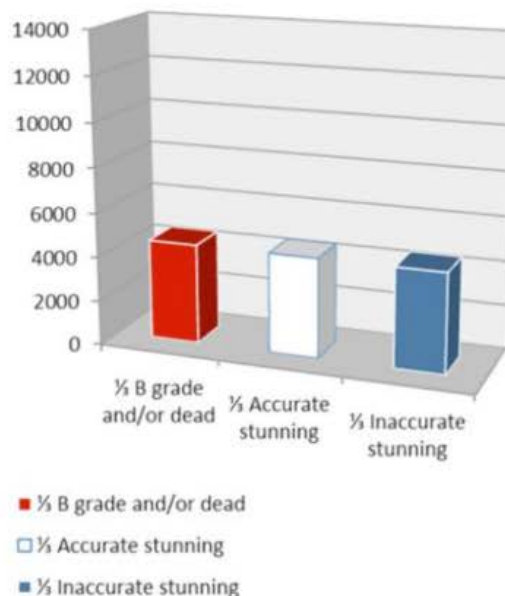


the EU1099 legislation on stunning. The system uses an exact amount of current which is logged for each bird. The system is very compact, especially when compared with the equivalent CAS systems. The whole unit, with some extra space for in and out feed, will fit into 16 square meters.


Dutch Vision Solutions has also invented an ingenious device – the Kill Line Shackle Splitter – that deals with the problem of birds that are not stunned by the legal amount of current because of weight variation. These birds are automatically transferred to a water-bath for immediate stunning. This water-bath also acts as the required back-up stunner should there be a problem with the Head-Only Stunner. Using this dual process, the Head-Only Stunner has a 99.4% accuracy in applied stuns. The Head-Only Stunner is very slightly more expensive than the water-bath method and significantly cheaper than CAS systems. It can be set up to provide reversible stuns so is open for use in Halal chicken production.


Another method for processing poultry, Low Atmospheric Pressure Stunning (LAPS) was at a very early stage of development when the European Commission report was compiled and was only in use in the USA. This system has been designed by a US company, TechnoCatch, and has been used successfully by OK Foods of Arkansas for several years. Instead of immersion in a controlled gas environment the system induces hypoxia (lack of oxygen) through a reduction in air pressure. TechnoCatch points to particular advantages of the


Water bath stunning efficiency at 13500bph totals





LAPS system:

 LAPS achieves stunning without the addition of gas or the use of electrical shock.

 LAPS is not only humane but also improves the economics of stunning and meat tenderness

 LAPS is compact and includes continuous monitoring.

 LAPS holds each bird in the same atmosphere ensuring uniformity of process.

 LAPS provides improved conditions for both the birds and humans.

All these points were backed up in a review of the system by the Humane Slaughter Association in London in 2013. It concluded that, "LAPS appears to offer significant advantages over other commercial methods of slaughter for broilers, from animal welfare. Operational and economical perspectives." OK Foods have pioneered the use of LAPS in the meat production industry and confirm the benefits and advantages of the system. It is a stun and kill system which, therefore, would not meet the requirements of kosher and halal chicken production. The system is currently not accepted by the EU but this situation is under review.

HALAL MARKET

THE WORK OF THE JARVIS PRODUCTS Corporation provides a fine example of adaptation, innovation and development within the meat industry. Jarvis has a global



A TOOL FOR YOUR COMPANY TO MONITOR ANIMAL WELFARE ON THE DAY OF SLAUGHTER

By Margit D. Aaslyng and Lars Kristensen

Animal welfare on the day of slaughter is important, not only because a company might require a high level of animal welfare, but also because it is good business. The carcass will show if there is a problem with animal welfare, e.g. as an increased drip loss or if trimming is required, which can imply an economic loss.

DMRI Danish Technological Institute has developed a slaughterhouse tool called Welfare & Quality Check. The slaughterhouse is studied methodically together with one or more employees. Some problems occurring before slaughter can be seen on the carcass as haemorrhages. For that reason, we start the study in the deboning room in which the occurrence of haemorrhages and faulty stickings are accounted for. Then we continue to the lairage area, in which the layout and handling are assessed from arrival to stunning. In the end, the scores are settled, and the marks 'Very good', 'Good' or 'Unsatisfactory' are awarded, dependent on the result. In this way, the slaughterhouse will receive an assessment stating whether the standard lives up to the expectations, or if procedures or layout could be optimized favourably.

The Welfare & Quality Check is based on a combination of management and layout as well as animal-based measurements, such as corneal reflex (spontaneous reaction of the eye when it is touched), skin damage and haemorrhages. In this way, we ensure that not only inadequate layout, but also incidents of low welfare in adequate layout are identified. At the same time, the areas in which economic value can be gained are clarified, by starting in the deboning room in which trimming can be quantified.

To ensure permanent improvements, 1-3 employees are educated to perform a



Welfare & Quality Check themselves at the slaughterhouse. When the slaughterhouse is studied regularly, you can be sure that no slide takes place in animal welfare resulting in negative economic consequences. In this way and with a minimum of effort you always have an updated status for this area of the slaughterhouse. A Welfare & Quality Check (a methodological examination of the slaughterhouse together with education of employees) is performed during approximately one week and is finalized by issuing a diploma.



Margit Dall Aaslyng, PhD is an expert in documenting animal welfare on the day of slaughter in pig production facilities. She also has an insight into consumers' understanding of animal welfare and how it can be transformed into willingness to pay.



Lars Kristensen PhD, Meat Science and Technology Product Manager covering animal handling, animal welfare and product quality improvement in the meat industry

www.dmri.com

HEAD-ONLY ELECTRICAL STUNNING: THE BEST ALTERNATIVE FOR CAS

Dutch Vision Solutions developed a high standard alternative for CAS, the 'Head-only' Electrical Stunning machine. It delivers high quality product as Head Only stunning applies reversible anaesthesia to each bird, compliant with the latest rules and legislations. Handling a production capacity varying from 3- to 14.000 broilers per hour (bph) it easily fits in with most poultry processors and delivers >99% well stunned broilers. The negative effects on the product from the most commonly used water bath stunning method doesn't count for both concepts.

This new innovative electrical stunner for broilers applies individual anaesthesia to each bird. The Head Only Electrical Stunner uses the resistance of the bird and applies a set milli-amp. to each individual bird, guaranteeing an effective reversible stun compliant with both EU 1099 & WATOK rules and legislations.

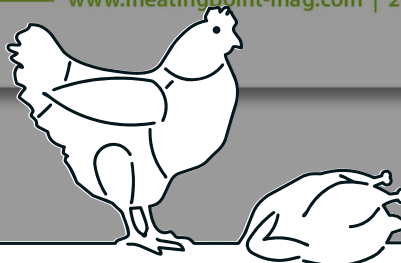
Tested by the renowned Wageningen University Livestock Research at 13,500 bph produced some overwhelming results and when used in conjunction with their revolutionary designed Kill Line Shackle Splitter over 99% of all birds were effectively stunned. With a backup stunner installed the system is 'FAR BEYOND' the EC 1099 regulations. In the report from the commission to the European Parliament, dated 12.19.2013, the commission mentioned: " Less cost per bird (0,974 € cent) then Controlled Atmospheric Stunning".

The Head Only Electrical Stunner is available for both 6" and 8" pitched lines.

The stunner needs in most existing lines only 16m² of floor space at line speeds of greater than 9,000 bph. Handling flock weights from less than 2kg to over 3kg, with a weight spread within the flock of up to 700g, before adjustment is required.

Important advantages of the head-only electrical stunner are less investment in the machinery and the minor workfloorspace of 16 m² then CAS. The 'Head-only' can be implemented in most common used lines from f.e. Foodmate, Baader-Linco, Meyn and Marel-Stork.

www.dutchvisionsolutions.com



IS GAS STUNNING AS HUMANE AS WE THINK?

Animal health authorities are researching ways to reduce unwanted side-effects of controlled-atmosphere stunning around the world. Glennis Kriel investigates current concerns and how gas stunning might be improved to minimise the symptoms of discomfort.

The primary mission of the Paris-based World Organisation for Animal Health (OIE) is to prevent the spread of livestock disease among its 180 member nations – but it is also constantly looking for ways to improve animal welfare worldwide.

When it comes to gas stunning, the process by which gases such as carbon dioxide or nitrogen are used to render the animals unconscious prior to slaughter, its main focus is on addressing side-effects which could be signs of unnecessary suffering.

"Gas mixtures that cause escape movements are not acceptable and the reactions of poultry or pigs should therefore be observed."

Welfare expert
Dr Temple Grandin

Dr Moetapele Letshwenyo, OIE Sub-Regional Representative for Southern Africa, whose office monitors animal health across 15 African nations, said the OIE does not have a problem with gas stunning if done properly. While this is the case in general, poor implementation has become associated with negative side-effects. In the case of birds, these can include head shaking, flapping of wings, convulsions and gasping.

Some ways of implementing gas stunning are better than others, Dr Letshwenyo explained. Gassing is more uniform when birds are subjected to the gas all at once, such as when they are lowered into the gas on a lift or elevator. When the birds are moved into the gas on a conveyor belt, the birds at the front often inhale more gas than those at the back of the container.

"The speed at which the birds are managed from when they are delivered until they are stunned is also a matter of concern, as it seems that more side-effects occur in plants where this process takes longer," Dr Letshwenyo said.

As more people use gas stunning, new information is becoming available, said Dr Letshwenyo, which has to be continuously reviewed to ensure it stays relevant. There is, for example, a lot of debate over which gases or mixture of gases are the best to use and at what ratios and dosages. There have been concerns over the use of carbon dioxide because this is a pungent gas that can irritate animals' eyes and respiratory tracts. There also seem to be differences between the ways individual animals react to these gases.

Dr Temple Grandin, Professor of Animal Science at Colorado State University in the United States, who has written the book *Livestock Handling and Transport*, said that there is likely to be a little discomfort before birds lose consciousness with gas stunning. However, in comparison with electrical stunning, where live birds have to be hung upside-down on shackles, they experience much less stress.

"Electrical stunning has the advantage of producing instantaneous unconsciousness," Dr Grandin explained.

"But handling to position the animal is more difficult as each bird has to be handled by a person and hung on a shackle. Hanging birds on a shackle is highly stressful to them," she said.

The drawback is that gas stunning does not induce instantaneous insensibility, which raises the question: how much stress and discomfort does the animal undergo before it loses consciousness?

"From a handling perspective, controlled atmospheric stunning is therefore far superior. The birds enter the stunner in the transport containers and handling by people at the plant is eliminated."

The drawback is that gas stunning does not induce instantaneous insensibility, which raises the question: how much stress and discomfort does the animal undergo before it loses consciousness? According to Dr Grandin, different researchers have reported different results.

In her opinion some discomfort during anaesthesia induction – as signalled by reactions from the animals such as gasping and head shaking – may be acceptable as a trade-off against greatly diminished handling stress. However, in cases where the general effects of gas inhalation are escape movements and attempts to climb out of the container, she sees it as a sign that the distress is too severe and the system should not be used. "Gas mixtures that cause escape movements are not acceptable and the reactions of poultry or pigs should therefore be observed," she said.



Dr Grandin added that staff operating the stunning system should be well trained to ensure they know what they are doing. Equipment should be calibrated and inspected regularly to ensure proper functioning, and she pointed out that wind around the plant building, changes in plant ventilation and opening and closing doors may alter gas mixtures in some systems.

Birds should be constantly monitored – through windows or cameras – from the moment they enter the gas until they fall over or lose posture. Dr Grandin's suggestion is that plants should use a scoring system to compare the reactions of birds during different batches. Birds showing symptoms of distress might score a three or a four, depending on the severity of the symptoms, while birds that show little distress might score a two and those showing no distress before they lose consciousness might score a one. In this way, staff could monitor birds' behaviour with consistency, making it easier to identify adverse reactions as soon as they appear.

Gas stunning has been used with great success in many processing plants in Europe and America. But its use remains limited to big commercial companies, and the main reason for this is the high cost of installation compared to electrical stunning.

"Gas stunning set-ups are much more expensive than electric stunning, so companies in general still tend to use electric stunning," said Dr Grandin, pointing out that, "Labour associated with gas stunning, nevertheless is much lower, because there is much less handling of birds pre-stunning."

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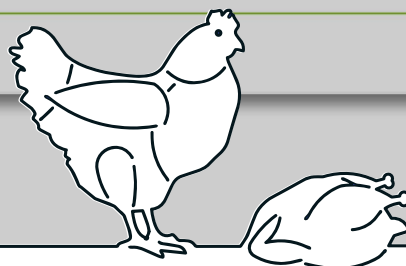


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USSS-1 AND USSS-2A PNEUMATIC STUNNERS FOR CATTLE

Jarvis Products Corporation has two pneumatically operated high-speed captive bolt stunners especially designed for better stunning, and improved meat quality. The USSS-1 Penetrating and USSS-2A Non-Penetrating Pneumatic Stunners are specially designed to implement high reliability, one shot, humane stunning procedures that render a stunned animal completely insensible to pain. Augmenting the stunners are the AST-101 (for USSS-1) and AST-103 (for USSS-2A) Air Stunner Testers; each ensuring correct tool calibration and bolt velocity after any stunner repair or maintenance procedure. Also available is the MSPR-1 Multi-Set Point Pressure Regulator that quickly sets pressure selection for both Jarvis stunners.

Jarvis provides free customer service, including equipment installation, service calls, and employee training.

USSS-1
Pneumatic Stunner Penetrating Bolt



USSS-2A
Pneumatic Stunner Non-Penetrating Bolt



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'Head-only' electrical stunner



In feed



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EC1099 & WATOK
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Halal accepted
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Far beyond the latest
EC1099, WATOK and EFSA rules, legislations and opinions,
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The only legally accepted reversible stunning to date,

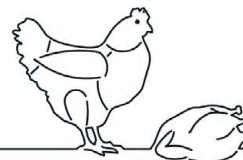
Applicable in lines from 1000 > 14000 bph,

When fully automated > 99% efficiency,

Limited floorspace: only 16m² + 9000 bph.

Independently tested by the Wageningen University

Improved product quality.



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Poultry Vision Far Beyond EC1099

'It can be concluded from this experiment that broilers are effectively stunned using a head-only stunner.'

- Prof. Ir. Bert Lambooij Henny Reimert,
University Wageningen, 2011

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'Head-only stunning with a 1 sec. high current followed by a 3 sec. low current results in effective stunning'

- Gerritzen, M.A., T. van Hattum, H. Reimert, 2015.
Wageningen University & Research Centre