

Tailor-made stunning for every bird

The new “head-only” stunning device is a legal electrical stunning method without any use of water. Based on the head resistance of the birds, they will all receive the exact current rate. A very high accuracy and limited carcass and meat defects are the results.

By Ad Bal

Stunning methods in poultry processing operations, are under discussion regularly. Of course, legislation is different everywhere. And in some countries and cultures, stunning is not an issue anyway. In these countries, like in the Middle East region, birds are slaughtered halal: according to the Islamic law without any stunning.

Particularly in Europe however, the public debate on the welfare of animals is playing a strong role in achieving new legislation. Particularly the current

water bath stunning method has been critically analysed by the EU authorities. In this method, the birds are hung at the shackles (positive electrode) with their legs, and electrocution is done electrically by contact of the head with an electrified water bath (negative electrode). As a result, the entire body of the bird is electrocuted, including the heart. Fairly regularly, however, not every bird will get the exact stunning dose. Either they get too much or too little. The birds may get stressed while passing through the water bath. Insufficient currents may physically immobilise the bird, but will not prevent the perception of pain, stress or discomfort. This may lead to contractions in the body resulting in internal haemorrhages and broken bones. As a result, carcass quality can be severely affected.

New recently enacted EU legislation requires that birds are rendered

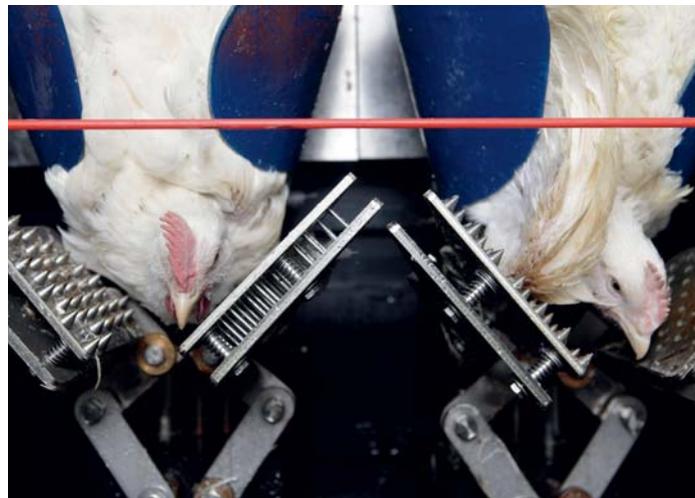
completely unconscious immediately during a stunning process. Legislation also requires that the birds need to remain fully anaesthetised until death.

Measuring the bird

In order to meet with these demands, a new “head-only” stunning device was developed by TopKip from the Netherlands. The machine is based on the fact that every bird is an individual creature which demands its own specific rate of stunning. “It’s like if you need to undergo an operation under anaesthesia in a hospital”, says Wim van Stuyvenberg of TopKip, who is the mastermind behind the new system. “Prior to the operation, various parameters are checked: weight, blood pressure, heartbeat, etc. Based on these figures, you will receive the exact amount of anaesthesia. Our head-only stunner actually is based on the same principle: every bird has its own



The birds are smoothly captured into a cone, which is made of flexible polyurethane and which is closing proportionally.



Once in a fixed position in the cone, the stunning device will capture the birds' head.

characteristics which we are measuring. And based on these characteristics, basically body mass and head resistance, the bird will receive the exact amount of stunning. By doing so, it will be fully unconscious within a split-second and does not turn into stress. It is a reversible method, enabling the bird to become conscious again after a while. In a slaughter plant, this is not very likely of course. Immediately after the stunning, killing will therefore have to take place.”

Carousel machine

How does it work? The head stunner is a carousel type of machine which is positioned in the infeed line of the processing plant. Once the birds arrive at the carousel, the shackles are moving in an outbound direction at the machine, meaning that a wider distance between the birds occurs. Meanwhile, the birds are smoothly captured into a cone, which is made of flexible polyurethane and which is proportionally closing. As soon as the birds are in a fixed position, their heads (which are accessible underneath the half open cone) are also captured by means of a metal device. It is adjustable to the head size of the birds. Springs inside enable the head to be captured without too much pressure. The head resistance of the bird will then be measured. And based on this figure, head stunning by means of electrocution will be applied over a period of 3

seconds at 250 mA. All the movements and head resistance of the birds are measured permanently during this period and the current is adjusted accordingly. This happens within hundreds of seconds. On the screen of the control panel, a graph clearly shows the permanent line of the current. If for whatever reason, one bird will be missed, a simple pusher will remove it from the line before it reaches the killing machine. The individual measuring also allows very precise tracking and tracing of each bird.

Extensively tested

“The system is considerably based on the natural behaviour of the bird”, says

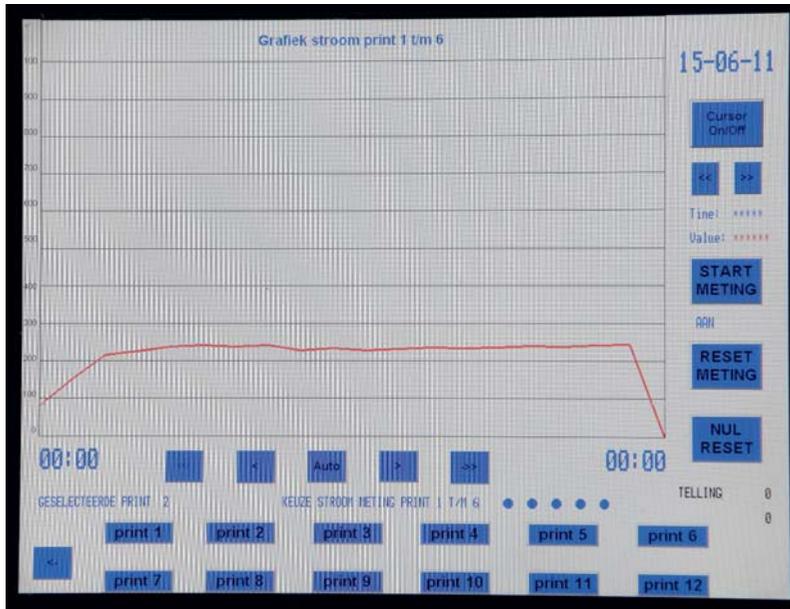


Wim van Stuyvenberg of TopKip: “The principle of our new head-only stunner is based on measuring the body mass and resistance of every bird individually”.

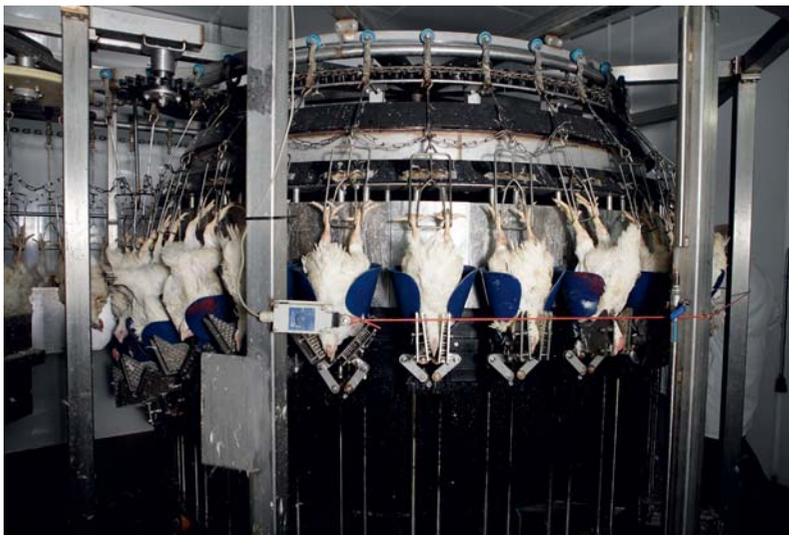


The design of the stunner is based on the birds behaviour of turning their heads to the direction where they came from.

On the screen of the control panel, a graph clearly shows the permanent line of the current to which the bird is exposed for three seconds.



The 3,20 meter diameter carousel has 32 cones and can easily be installed in any existing operation.



van Stuyvenberg. “We have noticed that once they are hanging on the shackles, they all turn their heads to the direction where they came from. The design of the stunning device is based on this behaviour. TopKip has extensively tested the head-only stunner and currently it is being used in a processing plant in the Netherlands. These tests have indicated that only very incidentally a bird is missed (less than 0.1%). The objective of TopKip is to further decrease this percentage to even less than 0.05%. Dutch government and EU representatives, as well as representatives from the processing industry and animal

welfare groups have seen the machine working. “They all are very positive”, says van Stuyvenberg. According to an examination of scientists of Wageningen UR Livestock Research in the Netherlands (2010), the head-only stunning method is a very promising alternative in poultry processing compared to the water bath system. The examination on 47 broilers was carried out using ECG recording. According to the report (327a) “the heart rate of the birds decreased significantly ($p < 0.05$) after stunning and recovered afterwards. The pH after chilling was significantly ($p < 0.05$)

lower in the group stunned head-only compared to the water bath group. The percentage of fillets free of blood splashes was 80% with no severe blood splashes in the carcasses stunned head-only. This was 16% and 12% respectively compared to those stunned in the commercial water bath. Such high differences were not observed in the legs.” The scientists concluded that broilers may be insensible and unconscious after head-only electrical stunning using an average current of 190 ± 30 mA (sinusoidal AC) for 0.5 second. For practical implementation they recommend a set current of 250 mA to overcome individual differences in resistance. TopKip is applying the officially required three second stunning time.

Patented system

“In order to prevent recovery, the stun should be followed by a neck cut within 10 seconds by severing all the major blood vessels”, the scientists advised in their report of last year. “Since carcass quality is limitedly compromised, such equipment should be further developed for practical application and commercial use”, they concluded. TopKip took this advice seriously and have almost now finalised the system. Current capacity for an 8 inch machine is 10,000 birds per hour. Also 13,000 bph will be possible soon in a 6 inch line. The 3,20 meter diameter carousel has 32 cones and can easily be installed in any existing operation. For safety reasons, the commercially available machines will have doors to protect workers in the plant. Of course small adjustments will have to be made all the time, even once the system is on the market. But the technology of this patented head-only dry-stunning method seems ready for the future. It promises to be a very good alternative for presently used systems as it fulfils new legislative requirements. ◀

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