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Dirty girl, clean meat

We didn't need the television documentary programme Zembla to alert us for the risk of carcasses being contaminated with the EHEC bacteria. We had already known for a long time that E.coli represents a serious public health risk and that slaughtering hygiene forms a critical check point which should not be underestimated.
There is definitely room for improvement in slaughtering practices to prevent faecal contamination of carcasses. Let's just consider the freeing and sealing of the esophagus.

For a short time now every cattle abattoir has the opportunity to use an efficient and reliable method for sealing the esophagus so that faeces, stomach contents, urine and bile no longer contaminate the carcass. The methods used to date, such as the use of a beef clip, can now be replaced by the Esophagus Plug System (EPS). Efficient, cost-saving and above all, hygienic and safe. A Dutch product, because it was developed by Kuziba in Enschede, the Netherlands.

Tomorrow's best practice
Erwin Heurman is director of Kuziba. His career as butcher, inspector and quality manager of a cattle abattoir provided him with the motivation for clean slaughtering. He started introducing various types of innovative systems on the market in the early 1990s. Kuziba is his most recent project: a series of new slaughtering practices developed with the designation 'Tomorrow's best practice' in a special collaboration with experienced engineers from the food-processing industry.
Even though NVWA and FASFC, but also the food retail sector and hamburger producers supervise the cattle slaughtering process, Kuziba shows that relatively large amounts of contamination are deposited on the meat when the esophagus is sealed with the so-called clip and when the stomach, intestines and liver are removed.

One log reduction
The story Erwin tells is not for the weak stomach. 'For years we have observed that 80% of the measured bacteriological contamination and faeces on meat is found on the front part of the carcass', he explains. 'Due to the hide cut and the dirty tools, the clean forequarter meat, the hands and the knives are contaminated with faeces. Then the faeces are spread on the outside and in the neck because the esophagus is removed from the windpipe to deep in the chest and then clipped. The esophagus is cut through, which allows the rest of the stomach contents to leak out of the esophagus and contaminate the forequarter meat.'
Heurman then explains how the esophagus swings around, leaking continually, during the entire slaughtering process, with the result that residue from the dirty esophagus leaks and contaminates the carcass. 'During removal, the diaphragm causes the residual contents of the esophagus to be pressed out in the chest cavity, after which the contents leak towards the neck and ultimately out of the carcass. In the last phase of removal, the cut end of the esophagus whips out of the carcass and spreads a spray of faeces inside the chest. We see that the above contamination is entirely unnecessary in actual practice.'
According to Heurman, bacteriological analyses at the sites of customers of Kuziba show that a reduction of 1 log is feasible in comparison with the common bacterial levels.

With a plug
The basic idea behind the developments of Kuziba is simple: do not get faeces on the meat if this is not necessary. A system was developed for that purpose: it seals the esophagus from the inside out,

without any hide cuts. A special tool is used to seal the esophagus hermetically with a plug via the mouth just in front of the stomach entrance. The remains of the contents present in the esophagus, throat and mouth are washed away automatically, so they do not lead to contamination later in the process.
Sealing is achieved within one second; the operator spends no more than 10 seconds on the animal. The Kuziba website has an animation of the technique used.

Significant improvement
Apart from the method for sealing the esophagus, Kuziba also examined the highly risky process of removing the stomach, intestines and liver. Video analyses show that every carcass is contaminated because the dirty esophagus is pulled through the diaphragm. The videos also show that carcasses become seriously contaminated because the operator is not given enough time to perform his cutting. For one in every three carcasses this results in the intestines and/or the gallbladder bursting. Conventional guidelines have resulted in removal processes which allow the stomach, intestines and liver to fall uncontrolled from the carcass. Kuziba advises the slaughterer on how the drop of the stomach, intestines and liver can be controlled in a simple way, thereby achieving a significant improvement in the microbiological slaughtering data.

Esophagus Plug System

For more than 20 years a technique has been sought after which would enable the esophagus of cattle to be sealed efficiently during the slaughtering process. Biomedical mechanical engineers in the Kuziba project studied the wonderfully sophisticated structure of the esophagus wall. Mother Nature has ensured that it is almost impossible to plug an esophagus. The methodical approach also led to the solution, with a technique which can draw together organic tissues of varying diameter and seal them permanently and watertight: the Esophagus Plug System. This has a huge impact on the slaughtering process. All of Kuziba's customers were offered the possibility of working with the system for four weeks, free of obligation, so they could assess the improvement in bacteriological results and financial returns themselves.