Identifying reasons for stun failures in slaughterhouses for cattle and pigs: a field study

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Abstract

Checking the effectiveness of stunning was one of the major tasks when the authors evaluated the stunning process on request of the slaughterhouse managements, retailers or competent authorities in slaughterhouses in Austria, Germany and Switzerland between the years 2000 and 2011. A total of 50 assessments in slaughterhouses for cattle and 116 for pigs were included in this study. For every assessment the technical features of the stunning device, the performance by the personnel and the clinical signs of the animals after stunning were recorded. The assessments of captive-bolt (CB) stunning were made in 1,823 cattle. For pigs, 63 assessments were carried out in electrical stunning (26 in a pen [ESP], 24 in a trap [EST] and 13 in an automatic restrainer [ESR]) and 53 assessments in CO2 stunning, covering a total of 35,220 pigs (6,855 electrically stunned and 28,365 stunned using CO2). The proportions of assessments in which there were no failures were 28% (CB), 12% (ESP), 21% (EST), 31% (ESR) and 13% (CO2). The mean percentages of animals showing signs not compatible with sufficient depth of stunning were 13.5 (± 19.0)% (CB), 12.5 (± 16.4)% (ESP), 10.9 (± 11.4)% (EST), 3.2 (± 3.3)% (ESR) and 7.5 (± 13.0)% (CO2) showing a high variability between premises assessed. Stunning effectiveness for cattle was better where a chest stick was performed compared to a neck cut. For pigs, less stunning failures occurred in electrical stunning where the two-cycle method (head/heart current) was applied compared to head-only stunning, and most of the failures in CO2 stunning were due to insufficient dwell time. Reasons for the stunning failures are described and recommendations given to improve the situation.

Keywords: animal welfare, captive-bolt stunning, cattle, CO2 stunning, electrical stunning, pigs

Introduction

Stunning of slaughter animals is a difficult issue: healthy animals must be rendered unconscious and killed in a short time to be further processed to become a product suitable for human consumption. Animal welfare, worker safety, product quality and economical aspects all have to be taken into account.

The aim of this study was to compile the findings of slaughterhouse inspections with a focus on the stunning process (captive-bolt stunning in cattle, CO2 and electrical stunning in pigs) to give an impression on stunning effectiveness under field conditions and identify apparent reasons for stun failures.

The assessments were carried out on request of the slaughterhouse managements, retailers or the competent authorities. The results were analysed and we present recommendations about improvements for better stunning.

Materials and methods

Between 2000 and 2011, 116 assessments (pigs) and 50 assessments (cattle) were undertaken. These involved 58 pig-slaughter plants and 25 cattle-slaughter plants. The assessments were carried out during routine slaughter procedure in commercial plants in Germany, Austria and Switzerland. In some slaughterhouses, the assessments were repeated after one or two years and these have been counted as separate assessments as conditions had been changed. At every assessment, the technical properties of the stunning device, the performance of personnel and the clinical signs of the animals after stunning were recorded. The 50 assessments of captive-bolt stunning in cattle covered a total of 1,823 animals. Table 1 gives an overview of the assessments of pig plants using different electrical methods and CO2 stunning.

The number of animals examined during each assessment varied according to slaughter speed and capacity of the slaughterhouse. Stunning effectiveness was checked over a period of at least 2 h.

In order to analyse the process, a definition of failures for each method was established according to scientific premises and experience of the authors. Each assessment was undertaken by two veterinarians except in small slaughterhouses with low slaughter speeds (eg 5–20 animals h⁻¹), where one veterinarian undertook the investigation. Electrical parameters and gas concentrations were assessed with the authors’ own equipment and the results compared...