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PROMOTING ANIMAL WELFARE AND SUSTAINABILITY IN THE POULTRY INDUSTRY: A COMPARATIVE ANALYSIS OF STUNNING METHODOLOGIES IN BROILER CHICKENS IN SOUTHERN BRAZIL.

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RESUMO

One Health and animal welfare are fundamental pillars in the production of animal-derived food, reflecting the interconnectedness between animal, human, and environmental health. This study was conducted at a large broiler slaughterhouse in southern Brazil, using data from the federal inspection service (SIGSIF/MAPA) specific to the facility, which processes up to 250 thousand birds daily. The research aimed to examine macroscopic differences in broiler carcasses and giblets of animals exposed to two distinct stunning methods which were applied on the same day in two shifts: electronarcosis in the morning and a modified Controlled Atmosphere Stunning (CAS) technique using CO^2 in the afternoon. Comparative macroscopic findings between the methods were analyzed. The only facility employing this method in Latin America, CAS presents itself as a promising option for enhancing animal welfare during slaughter. In this approach, broilers are exposed to a controlled CO^2 atmosphere, gradually inducing loss of consciousness and pain sensitivity. It involves an initial phase of analgesia induction followed by deepening unconsciousness leading to death. CAS potentially lowers the risk of bruises or fractures as birds are rendered insensible before hanging, unlike in electronarcosis, where hanging occurs while they are awake. The results revealed distinct appearances and textures in the giblets, characterized by varying colors, while no notable differences were observed in the carcasses themselves. Particularly, the livers of birds exposed to CAS exhibited darker hues and greater friability upon palpation compared to those subjected to electronarcosis. Additionally, the pericardial fat appeared uniformly darker across all samples, possibly indicating a reduction in pre-slaughter stress associated with CAS. This difference in color likely stemmed from the stunning method rather than the bleeding phase. Notably, the use of CAS led to a reduction in condemnations due to traumatic injuries (from 0.55% to 0.26%) and gastrointestinal contaminations (from 11% to 9%) compared to electronarcosis. This suggests that increased bird agitation during electronarcosis may impact the evisceration process, leading to higher contamination rates. Conversely, in CAS, birds are hung for bleeding post-mortem, potentially reducing the probability of fractures as workers handle them while motionless. In a scenario of millions of birds slaughtered annually, these small percentages might impact bird welfare and the mitigation of economic losses. Stunning methods like CAS may enhance bird welfare and food safety. This technique presents a sustainable model for the poultry sector, reducing resource consumption like water and energy, improving production efficiency, minimizing waste, and championing animal welfare.

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PALAVRAS-CHAVE: Controlled Atmosphere Stunning, CO2, Birds, Slaughter, Condemnations, Broiler chicken giblets, Pre-slaughter stress

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