

Assessment of Energy Use and Energy Efficiency in Two Portuguese Slaughterhouses

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Abstract : With the objective of characterizing the profile and performance of energy use by slaughterhouses, surveys and audits were performed in two different facilities located in the northeastern region of Portugal. Energy consumption from multiple energy sources was assessed monthly, along with production and costs, for the same reference year. Gathered data was analyzed to identify and quantify the main consuming processes and to estimate energy efficiency indicators for benchmarking purposes. Main results show differences between the two slaughterhouses concerning energy sources, consumption by source and sector, and global energy efficiency. Electricity is the most used source in both slaughterhouses with a contribution of around 50%, being essentially used for meat processing and refrigeration. Natural gas, in slaughterhouse A, and pellets, in slaughterhouse B, used for heating water take the second place, with a mean contribution of about 45%. On average, a 62 kgoe/t specific energy consumption (SEC) was found, although with differences between slaughterhouses. A prominent negative correlation between SEC and carcass production was found specially in slaughterhouse A. Estimated Specific Energy Cost and Greenhouse Gases Intensity (GHGI) show mean values of about 50 €/t and 1.8 tCO₂e/toe, respectively. Main results show that there is a significant margin for improving energy efficiency and therefore lowering costs in this type of non-energy intensive industries.

Keywords : meat industry, energy intensity, energy efficiency, GHG emissions

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