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The Impact of Livestock Emissions on the Maritime Sector

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ABSTRACT

The main reasons for all the environmental issues are the GHG emissions. This study compares the cattle emissions on livestock ships with the main engine emissions. The aim of this research is to give a preliminary result to policymakers and maritime organizations to consider new regulations for mitigating cattle emissions in the maritime sector, since they are as dangerous as the main engine emissions.

1. Introduction.

Cattles contribute to more than 15% of the global GHG emissions. Cattles are considered a significant source of GHG emissions in the maritime sector (Elmallah et al., 2023; Elmallah et al., 2024). It is important to implement new regulations to mitigate the GHG emissions of livestock in shipping. The aim of the study is to calculate the CO2 emission of the main engine of the MV Gelbary Express and to calculate the cattle CO2-e emission. The study highlights the huge amount of cattle emissions in the maritime sector.

2. Methodology.

The calculation took place on the MV Gelbary Express ship under engine full load and livestock full capacity during 24- hours sailing period. Equation (1) shows the engine CO2 emissions, where S.P.C is the specific fuel consumption, Cf is the CO2 fuel conversion factor, P is the engine power, and t is the trip duration.

$$E_{co2} = SFC.CF.P.t \tag{1}$$

$$MMTCDE_{CH4} = MMT_{CH4}.GWP_{ch4} \tag{2}$$

$MMTCDE_{CH4}$ are the million metric tonnes of carbon dioxide equivalents, MMT_{CH4} is the million metric tonnes of CH4, and GWP_{ch4} is the global warming potential of CH4.

3. Results and discussion.

Figure one represents the comparison between the cattle CO2-e emissions and engine CO2 emissions. The emissions are calculated in kg. and emphasize that cattle emissions are considered very high compared to the engine emissions.

Table 1: Cattle emissions and engine emissions.

	Engine load 4000 KW	Engine load 4500 KW	Engine load 5000 KW	Engine load 5500 KW	Engine load 6090 KW
Main engine emission	52224	58750	65280	71800	79500
Full capacity cattle emission	59640	59640	59640	59640	59640

Source: Author.

Conclusions.

The results emphasize that cattle emissions are considered very high compared to the engine emissions. And it is mandatory for policy makers to implement new legalizations to mitigate the livestock GHG emissions in the maritime transport sector.

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