

## CARBON FOOTPRINT OF APPLE AND PEAR: ORCHARDS, STORAGE AND DISTRIBUTION

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**Keywords:** Apple; Carbon footprint; Greenhouse gas; Life-cycle assessment; Orchards; Pear

**Abstract** *Apple and pear represent 51% of fresh fruit orchards in Portugal. This paper presents a life-cycle (LC) greenhouse gas (GHG) assessment (so-called carbon footprint) of 3 apple and 1 pear Portuguese production systems. An LC model and inventory were implemented, encompassing the farm stage (cultivation of fruit trees in orchards), storage and distribution (transport to retail). The functional unit considered in this study was 1 kg of distributed fruit (at retail). Four different LC inventories for orchards were implemented based on data collected from three farms. Inventory data from two storage companies were also gathered. The main results show that the GHG emissions of apple and pear ranged between 192 and 229 gCO<sub>2</sub>eq kgfruit<sup>-1</sup>. The GHG emissions (direct and indirect) from the cultivation phase ranged from 36% to 60% of total emissions. Fruit storage, which lasted for as much as 8-10 months, was also responsible for significant emissions due to high energy requirements.*