# Bioaccessibility of Lead in Organic Amendments and Lime Incorporated Acidic Soil

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Lead (Pb) is one of the most common contaminants in soils. The most significant transfer pathway of Pb from soils to humans is via direct soil ingestion, which can be assessed by in-vitro bioaccessibility tests. Incorporation of organic amendments and liming materials has shown potential to reduce Pb bioaccessibility in soils. This study evaluated the effectiveness of incorporating organic amendments and $CaCO_3$ on reducing the bioaccessibility of Pb in an acidic soil. The field experiment was conducted in Hawa Eliya (6.968263°N,80.787415°E). The amendments were arranged in randomized complete block design with 4 blocks. The risk of direct ingestion of soil Pb was assessed by the standard simplified physiologically based extraction test at pH 2.5. Soils were passed through 250µm sieve prior to analysis to represent the fine soil fraction that could adhere to skin and potentially transfer to humans via soil ingestion. Initial total Pb concentration ranged from 98 to 296mg/kg and the initial pH of the soil was 6.25. The amendments were diluted soil total Pb concentration by 5 to 20% when compared with the unamended control. The bioaccessible Pb concentration of the soil was low and ranged from 1 to 3.5 mg/kg and it was 1.5 to 5% from the total Pb concentration. None of the amendments significantly ($P<0.05$) reduced the bioaccessible Pb concentration, but lime-added soils had the lowest bioaccessible Pb, which was 48 to 50 times lower than the control. A significant negative correlation was observed between bioaccessible Pb concentration and pH of the remaining soil-gastric after the in-vitro extraction. Lime reduced the acidity of the gastric solution and consequently it reduced the bioaccessible Pb. Incorporation of lime had potential to reduce the transfer of soil Pb to humans via direct soil ingestion.

**Keywords:** Bioaccessibility, Lead, Lime, Organic manure, Soil ingestion

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