PENENTUAN KANDUNGAN LOGAM BERAT (Pb, Cd, Cu dan Fe) PADA SUSU STERIL KEMASAN KALENG SECARA SPEKTROFOTOMETRI SERAPAN ATOM (SSA) DAN RESIKO KESEHATAN MANUSIA

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ABSTRACT

PENENTUAN KANDUNGAN LOGAM BERAT (Pb, Cd, Cu dan Fe) PADA SUSU STERIL KEMASAN KALENG SECARA SPEKTROFOTOMETRI SERAPAN ATOM (SSA) DAN RESIKO KESEHATAN MANUSIA

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Chemical product deterioration is caused by interactions between the packaged product and the packaging components. Sterile milk, powdered milk, and sweetened condensed milk are often packaged in plastic and cans to protect them from sunlight, prolonged packaging, storage, and other factors. These packaging materials react to form compounds with substances contained in the dairy product, including metal particles. This study aims to determine the heavy metal content of Lead (Pb), Cadmium (Cd), Copper (Cu), and Iron (Fe) in canned sterilized milk and assess their health risks to humans. Samples were taken from several brands of sterilized milk with varying shelf lives in Padang City. Analysis was performed using Atomic Absorption Spectrophotometry (AAS) after sample preparation through wet digestion using a mixture of HNO_3 and H_2O_2. Method validation demonstrated good sensitivity of AAS, with the lowest LoD value for Pb (0.1194 mg/L) and the highest for Cd (0.3931 mg/L). The analysis results showed that Fe and Pb metal contents tended to increase with shelf life, while Cd and Cu remained relatively stable. Estimated Daily Intake (EDI), Target Hazard Quotient (THQ), and Hazard Index (HI) values were calculated to assess potential health risks. All THQ and HI values were below 1, indicating that consumption of canned sterilized milk from the tested samples does not pose a significant health risk. This study emphasizes the importance of controlling the quality of packaging and shelf life of dairy products to ensure consumer safety.

Keywords : Sterile milk, Heavy metals, AAS, Health risks