

UNIVERSITI TEKNOLOGI MARA

**CADMIUM AND LEAD IN GOAT MILK AND ITS
POTENTIAL HEALTH RISK**

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**Project paper submitted in partial fulfillment of the requirements
for the degree of
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Declaration by Student

Project entitled "Cadmium and Lead in Goat Milk and Its Potential Health Risk" is a presentation of my original research work. Wherever contributors of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Haji Hashim Bin Ahmad as Project Supervisor and Mr .Abdul Mujid Abdullah as Co-Supervisor. It has been submitted to the Faculty of Health Science in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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Abstract

Cadmium and Lead in Goat Milk and Its Potential Health Risk

Norasmah Binti Zahar

Introduction: Milk and milk products provide a wealth of nutrition benefits. Since milk products are a very important human nutrient since their consumption has increased in recent years. These products are also a good source of calcium and their bioavailability is high. In recent cases the goat milk is widely used in medical purposes for examples for eliminating jaundice among newborn babies. Goat milk is one of the healthiest foods/drinks out on the market today. Goat milk is better for most people than cow milk simply because it is composed of smaller fat globules which make it easier to digest. This speed of digestion releases more good bacteria and enzymes in the consumer's body, better enabling them to absorb and utilize the nutrients without discomfort, stomach ache, or a variety of other typical milk allergy symptoms. (James Young, 2010). Furthermore, in terms of milk safety, raw milk is less in heavy metal exposure attributed to the manufacturing process. Raw milk obtained from animals reared in rural areas, assumed to have low lead contents but is susceptible to unhygienic conditions of the milkman, the containers for transporting and at the vendor shop (Enb et al., 2009). Toxic heavy metals are persistent, accumulate and are not metabolized in other intermediate compounds and do not easily break down in the environment. These metals are accumulating in the food chain through uptake at the primary producer level and then through consumption at the consumer level (Raikwar et al., 2008). **Objective :** To assess the concentration of heavy metals in goat milk and its potential health effects on humans. **Methodology:** Forty-eight goat milk samples were obtained from the Johor State involved districts of Kluang, Simpang Renggan, Kulaijaya, Skudai, Johor and Pasir Gudang. The milk samples were treated with wet digestion and subjected to Atomic Absorption Spectrometry (AAS) for Lead and Cadmium trace. Hazard Index (HI) was also determined. **Result:** Lead concentration in raw milk can be detected from all samples collected in non-industrial and industrial areas. The result analysis shows that the mean of lead concentration in goat milk collected from non-industrial area and industrial area was 0.588 mg/kg and 0.817 mg/kg respectively. The mean of lead concentration contravened the standards set by the Official Monitor of Romania, European Commission and WHO but does not contravene the Malaysian Limit Standard. The analysis shows that the mean of cadmium concentration in goat milk collected from non-industrial area was 0.0004 mg/kg while it was not detected for those samples collected from industrial areas. The mean of cadmium concentration does not contravene the standards set by the Official Monitor of Romania, European Commission,

WHO and also the Malaysian Limit Standard for cadmium.. **Conclusion:** The presence of Lead and Cadmium in raw milk for non-industrial and industrial area not exceeded the maximum permitted proportion under Malaysian Food Regulation 1985. The raw milk is safe for everyday consumption since the estimation hazards index is less than 1 ($HI < 1$). It indicates that raw milk is unlikely potential for adverse effects for those who consumed it every day. **Recommendation:** Further study need to be carried out in order to get all possible sources of heavy metals in raw milk.

Keywords : Heavy Metal, Milk, Absorption Spectrometry (AAS), Risk Assessmwnt