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Pesticide contaminated crop residues and water usage for dairy cattle rearing in Walapane DS division, Sri Lanka

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Abstract—Contamination of milk with pesticide residues is a matter of serious concern. The extensive use of pesticides may lead to environmental and food contamination also risk of contamination was occurred especially in up country because of scarcity of grazing lands. Abundance of crop residues in substantial amounts lead farmers to feed them adequately for cattle. Farmers who cultivate upcountry vegetables tend to apply higher amounts of pesticides due to the intensive cultivation of hybrid crop varieties and highly favorable weather conditions for the rapid spread of pests and diseases. The objectives of this study were to identify the types of pesticides used in the area, crop residues that are used as feed material and sources of contaminants which have an impact to the milk industry in Walapane. Primary data for the study were collected from thirty farmers randomly (n=30) representing three villages of Walapane DS division namely Ragala, Nildandahinna and Wewekelle. Major vegetables in the area were cabbage, tomato, beans, eggplant and carrot. Majority (64%) of milk farmers had Jersey crosses, while 36% had Friesian crosses. Most (53%) farmers carry out extensive rearing in roadsides and vegetable lands and intensive rearing of 47%. Farmers (84%) provide grasses and crop residues (16%) to cattle. Fresh grasses and crop residues were directly fed to cattle without any treatments. Farmers used well water (93%) and natural water stream (7%) as water sources. The majority (>90%) disposed the empty pesticide containers by throwing in the crop land and water sources itself. Farmers applied Mancozeb (47%), Propineb (37%), Fipronil (10%) and Maneb (6%) as pesticides for cultivation of vegetables nearby water sources while fungicides (Propineb 36% and Mancozeb 20%) applied nearby farm lands. Feeding with crop residues, grasses and water which were contaminated with pesticides encountered high risk to contain pesticide residues in milk in Walapane DS Division Sri Lanka.

Index Terms—Milk, Pesticides, Feed, Water, Walapane

I. INTRODUCTION

Sri Lanka, the pearl of the Indian Ocean is an island of 65, 525 sq. km and home to 20.1 million people. The land area under agriculture in Sri Lanka is around 2 million hectares, which is 30% of the country's total area of 65,610 sq. km. Almost 75% of the agricultural land is under small-holdings, and the total number of such holdings is less than 2 ha. Almost one third of these small-holdings have a mixture of crops and livestock. The total number of farmers involved in livestock production is estimated at 700,000, and between 30-60% of gross farm income is generated from livestock activities (3).

Milk is considered as one of the convenient food stuffs. Around 36.6% and 19.9% of milk collected in the country are from the Central Province and the North-Western Province, respectively (2). As a whole, Nuwara Eliya District in hill country gives the highest milk production.

Milk-producing animals, such as cows, accumulate residues of these insecticides when they eat contaminated feed, water and by inhaling contaminated air. Owing to their lipophilic properties, pesticides are initially stored in fat-rich tissues and subsequently are translocate and excreted with endogenous fat through the milk. Therefore, consumption of these fat-rich dairy products exposes organisms to unexpected residual levels of pesticides. Pesticides contamination which occurred in farms, grazing areas and water sources were estimated and quantitative estimation of identified pesticides residues in raw milk samples was done in Magastota area, Nuwara Eliya. Mancozeb, Propineb, Glyphosate, Chlorothalonil, Maneb, Chloropyrifos and Tebuconazole were recognized as major