



Risk of using crop residues and water that are contaminated with pesticides for feeding cattle's in Nuwara Eliya DS division

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Abstract

Farmers who cultivate upcountry vegetables in Nuwara Eliya apply high amounts of pesticides, due to the intensive cultivation of hybrid crop varieties and highly favorable weather conditions. The extensive use of pesticides may lead to environmental and food contamination. Presently highest milk production was reported in Nuwara Eliya. Abundance of crop residues in substantial amounts lead farmers to feed them adequately for cattle.

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 Nuwara Eliya. Forty farmers in four villages of Nuwara Eliya DS division namely Bambarakelle, Shanthipura, Galpalama and Ambewela were interviewed. Present breeds were Friesian, Jersey and local crossbreds (69, 23 and 7% respectively) and major crops were carrot, leeks, cabbage and potato. Due to grasslands scarcity, 70% of





farmers carry out intensive rearing. Farmers provide grasses (87%) and crop residues (13%) to cattle. Fresh grasses and crop residues were directly fed to cattle without any treatments. Farmers used tap water (53%) and well water (47%) as water sources. The majority (>90%) disposed the empty pesticide containers by throwing in the crop land itself. Farmers applied Maneb (31%), Fipronil (31%) and Propineb (20%) as pesticides for cultivation of vegetables nearby water sources while fungicides (Propineb 28% and Maneb 24%) 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.

Key words: Cattle Milk, Pesticides, Crop Residues, Water, Nuwara Eliya

JEL Classification: N50

Introduction

Sri Lanka, the pearl of the Indian Ocean is an island of 65, 525 sq. km and home to 20.1 million people. It is blessed with a wide range of climates and seasons (Yala and Maha) due to its terrain and abundant rainfall. 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 lands are 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 area of farm holdings with livestock is around 0.56 million ha, of which 99% are categorized as small-holdings. 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 (Sangakkara et al., 2007).

Milk is considered as one of the convenient foodstuffs. Milk and dairy products have long been acknowledged as an important constituent of a balanced diet. Among the various food products, milk has primarily been identified as having a high potential for the health improvement of human beings. It is an optimally rich source of vital nutrients such as proteins, fat, lactose, vitamins, minerals, enzymes, hormones, immunoglobulin, and cells. The consumption of milk in various forms has been very long standing tradition among the population. There are five major animal husbandry systems in Sri Lanka, viz., Coconut Triangle (Kurunegala, Puttalam), Dry Zone (Hambantota, Anuradhapura), Hill Country





Globally a lot of researches were done about pesticide contamination of milk though national level, very low number of researches were done regarding this issue. Chaminda et al, (2012) concluded that contamination of pesticide residues into fresh milk can occur because of the contaminated water sources and strictly because of contaminated crop residue feeding to dairy animals in Magastota area, Nuwara Eliya, Sri Lanka via field surveys. Pesticide 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. Mancozeb, Propineb, Glyphosate, Chlorothalonil, Maneb, Chloropyrifos and Tebuconazole were recognized as major pesticide contaminants in the area (Chaminda et al, 2012).

According to this situation, the milk production faced a conflict accompanied by pesticide residues. Recent research undertaken in Nuwara Eliya district does identification of important links between milk, milk products and pesticide residues (Chaminda et al, 2012). The objectives of this study were to identify the types of pesticides used in the area, crop residues that are used as feed materials and sources of contaminants which have an impact to the milk industry in Nuwara Eliya Sri Lanka.

Literature review

The term pesticides means industrial chemicals used to kill insects (insecticides) destroy unwanted plants (herbicides), to prevent mold and mildew (fungicides), to kill rodents (rodenticides), to kill algae (algaecides), and plant growth regulators. The use of agro chemicals on raw agricultural commodities has grown rapidly over the years. It has been estimated that the use of agro chemicals in some developing countries is increasing at a rate of more than 10 percent each year (Jayakody, 2006). While the number of agro chemicals used results in a substantial increase in yields of foodstuffs, they can also be the source of many problems from residues in food. Acute poisoning and chronic health problems have occurred from misuse of them. Most countries have specified by law or regulation which pesticides may be used on their foods.

The use of agro pesticides in Sri Lanka has increased over the last few decades. With the increased adoption of new high yielding crops and the expansion of the irrigation systems, the pesticide consumption has increased tremendously in recent past. On the other hand, the adoption of agrochemicals was sluggish until it was offered as an integral part of the package of practices developed to harmonize new high yielding crop varieties. In Sri Lanka, paddy





(Nuwara Eliya), Mid Country (Kandy) and Wet Zone (Gampaha, Matale). Around 36.6% and 19.9% of milk collected in the country are from the Central Province and the North-Western Province, respectively (Department of Animal Production and Health, 2011). As a whole, Nuwara Eliya District in hill country gives the highest milk production. The district of Nuwara Eliya is located in central province of Sri Lanka and it consists of five DS Divisions named as Nuwara Eliya, Hanguranketha, Ambathenna, Walapane and Kothmale. Total land extent of the district is 1741 km².

The government of Sri Lanka prioritized the development of the dairy industry as one of their main goals. However, years of conflict have severely damaged the livestock industry and the country is now dependent on imported milk powder and other dairy products to meet some 75% of annual needs. The government is currently seeking to reduce the dependency on imported milk powder through campaigns to increase fresh milk consumption. Along with this policy, development programs are aimed to improve the genetic lines of its dairy cattle, increase the herd size, increase productivity, and upgrade milk handling and processing facilities. Accordingly, the government is trying to achieve its goal of 50% local milk production by 2015 through genetic improvement and enhanced production (Department of Animal Production and Health, 2011).

Pesticides (insecticides, fungicides and herbicides) use is often a necessity with agriculture. Without it, the production costs can rise. The food crop production uses the bulk of pesticides in Sri Lanka. Pesticides have been applied to crops and animals for many years to control pests, fungi and weeds. There are various methods to reduce crop losses from pest and disease attacks, including biological, chemical and, mechanical methods and use of pest-resistant crops. But pesticide measures have the advantage over others because they are convenient to use, attain quick control and are able to reduce pests to extremely low levels. However the intensive uses of pesticides have a direct impact on human health, not only through the contamination of the water sources but also through acute and chronic pesticide poisoning of the ecosystem (Schlosser et al., 1999).

Milk producing animals, such as cows, accumulate residues of these insecticides when they utilize 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 beings to unexpected residual levels of pesticides.

