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Detection of Antibiotic Residues in the Water Buffalo Milk in Meshkinshahr, Ardabil Province, Iran

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Abstract: Fifty water buffalo milk samples were collected from Meshkinshahr (located in Ardabil province) suburb regions in the period from July 2009 to October 2009 by systematic random sampling methods. All samples were examined by Copan milk test (CHR. Hansen, Denmark). Out of the examined 50 samples 3(6%) were positive for antibiotic residues in water buffalo milk in the Meshkinshahr region. Although the results are reported in a qualitative way, the screening method can be used for the control of antibiotic residue in the water buffalo milk.

Key words: Antibiotic · Residues · Water Buffalo Milk · Meshkinshahr

INTRODUCTION

Antimicrobial agents are used in treatment of cattle and cause the presence of drug residues in milk. Mastitis is the most prevalent disease in cattle which requires antimicrobial treatment [1, 2]. Drug residues in milk have a potential hazard for the consumer and may cause allergic reactions, interference in the intestinal flora and resistant populations of bacteria in the general populations, thereby rendering antibiotic treatment ineffective [3]. Consumers want to be confident that their food supply is free of contamination by herbicides, pesticides, drugs or antibiotics.

Antibiotics decrease the acid and flavor production associated with butter manufacture and they reduce the curdling of milk and cause improper ripening of cheese [4]. We were unable to find reports in our search of the literature. This study was carried out to evaluate the antibiotic residues in water buffalo's milk at Meshkinshahr (located in Ardabil province), Iran.

MATERIALS AND METHODS

Fifty water buffalo (*Bubalus bubalis)* milk samples were collected from Meshkinshahr (located in Ardabil province) suburb regions from July 2009 to October 2009 by systematic random sampling methods. All samples were examined by Copan milk test (CHR. Hansen, Denmark). Copan test is based on inhibition of B. stearothermophilus by antibiotic residues in milk [5]. This test is very sensitive, economic and very simple in use. A minimum of 16 wells can be used. After removing the alufoil and added 100µl of milk sample into each well, the plate was covered with the foil provided in the kit and incubated for 3 hours at 64 +/-1°C either in a water bath or a dry block heater.

At the end, if the color changed to yellow, the test is negative or changed slightly to yellow-purple, it is partially positive but the concentration of the inhibitory substances is below the sensitivity of the test, and if the color remains purple, the test is positive.

RESULTS

Three (6%) out of the 50 samples were positive for antibiotic residues in the water buffalo milk in Meshkinshahr region (Fig 1).

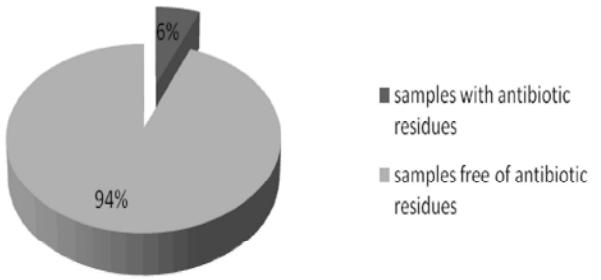

Fig. 1: Percent of positive samples for antibiotic residues in the examined water buffalo milk in Meshkinshahr region

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DISCUSSION

Antibiotic residues were present in 6 percent of the water buffalo milk samples at Meshkinshahr region. Khaskheli *et al*. [6] showed that 36.5% of the examined samples were contaminated by beta lactam antibiotic residues in cow raw milk in Pakistan.

In Turkey, there are only a limited number of studies about the antibacterial residues in milk. In a study by Ceyhan and Bozkurt [7] who reported that from a total of 200 milk samples collected from Ankara region, 5.5% was positive for antibiotic residues. Ergin kaya and Filazi [8] found that in 204 raw milk samples, 44% was positive for antibiotic residues in Turkey. Aydmn *et al*. [9] reported that in 2686 ewe raw milk samples, 1.7% was positive for antibiotic residues.

Adesiyun and Webb [10] studied the prevalence of antimicrobial residues in preprocessed and processed cow milk in Trinidad, and showed that 10.8% of all samples were positive. Shitandi [11] showed that 21% of 1109 milk samples were positive for antibiotic residues in Kenya.

Alomirah *et al*. [12] showed that 5.4% of imported pasteurized milk samples were positive for antibiotic residues in Kuwait, and Out of the 308 samples analyzed for beta lactams, 62 samples (20.1%) were above the maximum residue level (MRL) (4 ppb). One hundred twenty-one samples (37.3%) were above the Tetracycline MRL (100 ppb) from a total of 324 analyzed samples. Sixty-one samples (29.4%) were positive for Chloramphenicol (no MRL, prohibited antimicrobial drug) from a total of 207 analyzed samples.

Reported detection of antibiotic residues in milk and other foods varies widely from country to country being highest in countries where the antibiotic residue control is ineffective. In addition to allergic reaction there is some indication in the science literature to suggest that antibiotics can induce cancer and other non-cancerous hazardous effects on the body [12].

This study showed that effective preventing program to reduce the presence of antibiotic residues in milk to acceptable limits must be run in the northwest region of Iran. It seems that the withdrawal time must be considered for the animal treatment by the antibiotic drugs.

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