NATO Science for Peace and Security Series - C:
Environmental Security

Impact of Pollution on Animal Products

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Springer

PLANT, WATER AND MILK POLLUTION IN KAZAKHSTAN

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Abstract: Since its independence in 1991, Kazakhstan is in a state of "ecological crises", due to the specific place for nuclear test by soviet government for long time, and to the development of irrigation for field cottons linked with decreasing Aral Sea level. In addition the manufacturing of metals and the minerals had some impact on environmental contamination.

In the South of Kazakhstan, eight farms were sampled close to probable pollution sources. Samples of camel milk, fodder and water were collected in each farm and analyzed for copper, iron, manganese, zinc, arsenic and lead. The mean content in fodder of Cu, Fe, Mn, Zn, As and Pb was 10.40 ± 2.93, 793.69 ± 630.48, 62.38 ± 20.67, 32.95 ± 27.15, 1.03 ± 0.49 and 4.28 ± 9.60 ppm respectively. In camel milk mean content of these heavy metals was respectively of 0.07 ± 0.04, 1.48 ± 0.53, 0.08 ± 0.03, 5.16 ± 2.17, <0.1, and 0.025 ± 0.02 ppm respectively. No heavy metals were detected in samples of water with the analytical methods used. .

The relationships between heavy metals in water, forages and milk were not clear. Some information's are lacking. We need to extend sampling at more areas where camels, cows, goat and sheep farms are closed to pollution areas, and analyzed other heavy metals suspected in pollution process.

Keywords: Camel milk, trace elements, heavy metals, fodder grass, pollution

1. Introduction

Kazakhstan has to face to important ecological problems due to nuclear tests, used of pesticides, polymetal industries, spatial base and traffic road increasing. In addition, in some areas there is overgrazing, decrease of water sources (Aral Sea for example) and their contamination by human activities (wastes of industries, pesticides residues...).

In literature, some references on heavy metals content in cow and breast milk are available. But concerning sheep and goat milk there are few references, and no one on camel milk.

According to the literature, there are some factors which influence the concentration of heavy metals in milk. These factors are in generally the levels and kind of human activities in the area of study. In that case, traffic road intensity plays a role on lead content in cow milk. In fact, the lead content in milk was positively correlated to the traffic density, (from 0.36 ppm on average for a traffic density of 10 vehicles per day to 7.20 ppm on average for a traffic density of 15,000 vehicles per day) (Bhatia and Choudhri, 1996).

Some studies showed significant difference on lead, arsenic, zinc, copper, iron concentration in milk in function of human activities near the sampling areas. Thus, lead concentration in cow milk was on average of 0.00132 ppm in rural area (Licata et al., 2003) and of 0.25 ppm in industrial area (Swarup et al., 2005) and 0.032 ppm close a road (Simsek et al., 2000). In Germany and Holland, higher value allowed is 0.05 ppm of Pb in milk, 0.02 ppm in Turkey and 0.1 ppm in Kazakhstan.

In industrial area, lead concentration of cow milk varied from 0.049 ppm (Simsek et al., 2000) to 0.067 ppm (Dey and Swarup, 1996), with higher value of 0.844 ppm on average, obtained near zinc and lead smelter (Swarup et al., 2005).

B. Faye and Y. Sinyavskiy (eds.), *Impact of Pollution on Animal Products.*