



MINISTRY OF JIHAD-E-AGRICULTURE

Agricultural Research, Education and Extension Organization

Agriculture and Natural Resources Research
Center of Zanjan

Effects of pollution of Zanjan Zinc town activity on animal and products of the area and suggestion of methods for reducing their effects

Research worker :Mohammad Hossein Nemati

Abstract

This research was carried out to monitor the effects of contamination caused by the vicinity of a specialized industrial park of zinc (VSIPZ) on livestock and livestock production in Zanjan province at a radius of 5 km. After getting villages and livestock and poultry breeding areas in the desired radius, a sampling of livestock and livestock products in any of the main directions were done. Field operations included the sampling of blood, fibers (wool, hair), hoof, different tissues (meat, milk, and eggs), and sensitive and goal organs in heavy metals accumulation (kidney, liver, bone). Control area to compare the current situation was also considered. In this experiment, a dry ash method was used to digest organic matter. Results showed that the accumulation of heavy metals, especially zinc (Zn) and lead (Pb) in rangeland forage compared with the control group was significantly higher ($p < 0.05$). In the west region, Pb concentration in sheep milk was significantly higher ($p < 0.01$) and more than the recommended standards, despite the differences between regions in other elements, the concentration was authorized in the domain. Also in the west region of VSIPZ, accumulation of cadmium (Cd) in muscle ($p < 0.01$), liver ($p < 0.05$) and all samples are always higher than in other areas, but concentrations were within the normal range. Concentrations of copper (Cu), Zn and Pb except for Cu in the sheep liver ($p < 0.01$) were not significantly different. There was the inverse relationship between Cd and Cu accumulation and in the liver samples of the west region of VSIPZ was the lowest (7.59 ppm). An orthogonal comparison showed that the accumulation of Zn, Pb, and Cd in the wool samples and Pb and Cd levels in hair samples were significantly higher than the control group ($p < 0.05$). The highest concentration metals in the sample were seen in the south of VSIPZ, but in the case of Cu, there was not any difference between the regions and the control group. The concentration of Cu and Zn in egg samples were significantly different between groups ($p < 0.01$) so that the samples of south area of VSIPZ had the highest concentration of these metals. The concentration of Pb and Cd between different

regions were not different. Generally, the results showed that despite the accumulation of heavy metals in the west and south area of the VSIPZ, the concentration of this element in the livestock and livestock products produced in the round of VSIPZ were in the normal domain and it was not any danger for consumers

Key Word: animal tissue, monitoring, Zanzan, zinc, milk, heavy metal