

**FOOD SAFETY ISSUES IN THE POSTCONFLICT TRANSITION PERIOD OF  
SOUTHEAST EUROPE.**

**“LEAD INTO THE FOOD CHAIN IN RURAL ALBANIA”**

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**Abstract**

Abrupt changes in the socio-economic settings may sensibly aggravate food safety issues and threaten the public health. Post-conflict periods in Southeast Europe triggered the onset of acute problems in food safety and in many cases animal production was involved as well.

Lead food poisoning cases in rural Albania, might be considered as representative to the period. The poisoning resulted from lead contaminated flour originating from repair of rural mill's cracked grindstone with metallic lead. Intoxication cases were reported all over the country rural areas, following the period of social unrest and conflicts in March 1997.

In North of the country, lead levels as high as 510 and 485 ppm were measured in flour and bran. The blood lead concentrations in the hospitalized individuals ranged from 0.31-0.95 ppm. The lead concentrations in the blood of cattle ranged from 0.13 to 0.44 ppm, whereas the corresponding lead milk levels ranged between 0.45 and 0.72 ppm.

The Situation of Food Safety in southeastern European countries, emerging from conflict situations as part of a difficult transition, clearly indicates how the associated sudden and abrupt changes in the socio-economic settings may sensibly aggravate food safety issues and threaten the public health. The Albanian cases might be regarded as representative for the region.

In Albania the period of anarchy following the collapse of state structures in early March 1997, comported drastic changes in food production patterns in rural areas.

Due to the imposed shortages in the imported flour, in many rural areas people had to make use of local inactive mills to procure the necessary food supplies . While trying to reactivate the old mills, in many villages metallic lead was used to repair the cracked grindstones.

Severe lead poisonings in humans from heavily contaminated flour was the consequence. Intoxications were reported from different villages all over the country, and lactating cows were exposed as well (Bardhoshi 1997).

### **Case Report**

On early April 1997, severe lead poisoning in humans were reported from a poor village in North Albania. The poisoning from heavily contaminated flour involved 11/29 families of the village. Almost 18 family bred cows were exposed to lead, through contaminated bran originating from the same mill as well. A 17 y-old -female and a 30 years old male from the same family died following acute abdominal pains, encephalopathic convulsions and coma. Subsequently 23 persons with symptomatic saturnism (acute abdominal pain, extreme fatigue), were admitted to the Toxicology unit of the University Hospital Center in Tirana. All recovered following 3 daily courses of chelation therapy with 10 ml of 1% EDTA-Ca in 500 ml saline.

### **Laboratory Analyses**

The analyses included blood from the hospitalized individuals, taken prior to the chelation therapy, flour samples collected from the grindstone of the mill and from the intoxicated families, and bran samples taken from cattle feed sacks stored in a nearby stall. Additionally blood and milk were collected from 18 lactating cows suspected of having been fed the contaminated bran feed. The analytical procedures and lead measurement through atomic absorption spectrophotometry have been described (Panariti et al 1998)

The flour, bran, blood and milk lead concentrations in humans and animals are presented in Tab 1 and 2.

The lead concentrations in flour and bran ranged at 195-510 and 225-485 ppm, respectively and are well above the lead permissible levels in cereals which is 0,2 ppm (Swed Food Re. 1989).

The lead concentrations in the blood of humans and cattle and the respective milk levels indicated clear exposures to dietary lead.

The blood lead concentrations in the hospitalised individuals ranged from 0,31 to 0.95 ppm, being generally above the levels where signs of toxicity occur (Bizhga 1994) and

compatible with their symptomatic status. The maximal level (0.95 ppm) was found in the blood of the 17-y-old female who died.

The lead concentration in the blood of cattle ranged from 0.13 to 0.44 ppm. Considering that initial signs of toxicity in cattle occur when blood levels are above 0.35 ppm (Blood et al 1989), it is interesting that several animals had levels above that and did not show clinical signs. However, the levels were lower than the 0.79-0.95 ppm ranged reported from other lead clinically intoxicated cattle (Sidhu et al 1994).

Lead concentrations in the cow's milk ranged between 0.45 and 0.72 ppm, being considerably above the 0.06-0.13 ppm usually found in normal bovine milk (Dwivedi 1995).

**Tab 1**  
**Lead levels in bran, blood and milk of cattle**

<b>Lead concentration in ppm</b>					
<b>Bran</b>		<b>Blood</b>		<b>Milk</b>	
Mean ±SE	Range	Mean± SE	Range	Milk ± SE	Range

**Tab 2**  
**Lead levels in flour and human blood**

<b>Lead concentration in ppm</b>			
<b>Flour</b>		<b>Blood</b>	
Mean ± SE	Range	Mean ± SE	Range
325 ± 18 (20)	255- 485	0.42 ± 0.05 (23)	0.31-0.95

Figures in parenthesis indicate number of samples

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