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HEAVY METALS MONITORING IN ANIMALS BLOOD AND MEAT AT SLAUGTERHOUSE, KHULNA, BANGLADESH

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Heavy metal content in fertilizers, pesticides and herbicides is used for farming and forestry. Lastly, heavy metals are up taken grassland through root, which increases the anthropogenic pollution on the ecosystem. Herbivorous animals e.g., cow, goat, sheep, buffalo, etc. feed on grass that accumulate the most metals into their body parts.

Meat and meat products are important for human being as they provide a big part of nutrients including essential trace elements. Thus, bad circulation of heavy metals adversely affected ontogeny and health of human and animals (Kertesz et al. 2006; De Vries et al. 2007). Heavy metal contamination is a great threat for their toxicity, bioaccumulation and biomagnification in the food chain (Demirezen & Uruc, 2006). These have permanent or temporary physiological toxic effects on tissues (Mariam et al. 2004). There is a great source metal contamination from the blood of slaughterhouse. Because after slaughtering the blood is directly disposed to the soil or ponds. It contributes bad odor and heavy metal pollution. In the recent years, much attention has focused on the levels of heavy metals in meat and blood of cow, goat and sheep with mere concern.

Here an investigation was carried to assess the heavy metals in meat and blood of cow, goat and sheep especially arsenic (As), iron (Fe) and manganese (Mn) in Khulna, Bangladesh.

The sample meat and blood was collected from local slaughterhouse, Khulna, Bangladesh and no delayed was made for acid digestion following the EPA Method 3050B. The acid digested aliquot was examined for the quantitative determination of As, Fe, and Mn by the atomic absorption spectroscopy (SpectrAA-220, VARIAN, Australia).

Table 1 – Heavy metals content in animal meat and blood

Origin	Sample	Metal content (mg/kg)		
		As	Fe	Mn
Cow	Meat	44.0 ± 0.3	26.5 ± 0.3	<LOQ
	Blood	1.9 ± 0.01	477.7 ± 2.01	<LOQ
Goat	Meat	<LOQ	24.3 ± 0.6	<LOQ
	Blood	<LOQ	266.2 ± 1.3	<LOQ
Sheep	Meat	<LOQ	38.2 ± 0.6	<LOQ
	Blood	21.3 ± 0.5	267.8 ± 1.7	4.6 ± 0.02

LOQ= Limit of Quantification

It is clear from the Table 1 that the series of heavy metals content both in blood and meat were as Fe > As > Mn. The amount of Fe content in the cow meat (26.5 mg/kg) is higher than the goat meat (24.3 mg/kg) but less than the sheep meat (38.2 mg/kg). The amount of As content in the cow meat was 44.0 mg/kg but in the goat and sheep meat was below the limit of quantification. The Mn content for all of the animals in both blood and meat was bellow limit of quantification except sheep blood (4.6 mg/kg). Fe content in the blood was higher than the meat for all animals and the highest amount (477.7 mg/kg) of Fe was in cow.

Annually 30 million goats are slaughtered in Bangladesh (Aziz 2012). In Table 2 shows the percentage of slaughtered with respect to the total amount of slaughtered animals and amount of blood (mL)/kg weight.

Table 2 – Blood content and slaughtered animals in Bangladesh

Animals	Slaughter animals (%) (Bangladesh INSPIRED 2013)	Amount of blood (mL/kg) (Monica 1953)
Cow	63.98	55
Goat	32.74	70
Sheep	1.09	60

It seems that per year, Bangladesh huge amount of blood is disposed to the environment. Although amount of heavy metals level was not significant but in the long run it will contribute role for environmental pollution.

The study reveals that the environment was contaminated with arsenic, iron and manganese. The manganese was below the detection limit. It could be better to take initiative for proper management the blood to save the environment.