

**Environmental Impacts of Shewashok Oil Field on Sheep and
Cow Meat Using Vital Trace Elements
As Contamination Bioindicators**

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Aim

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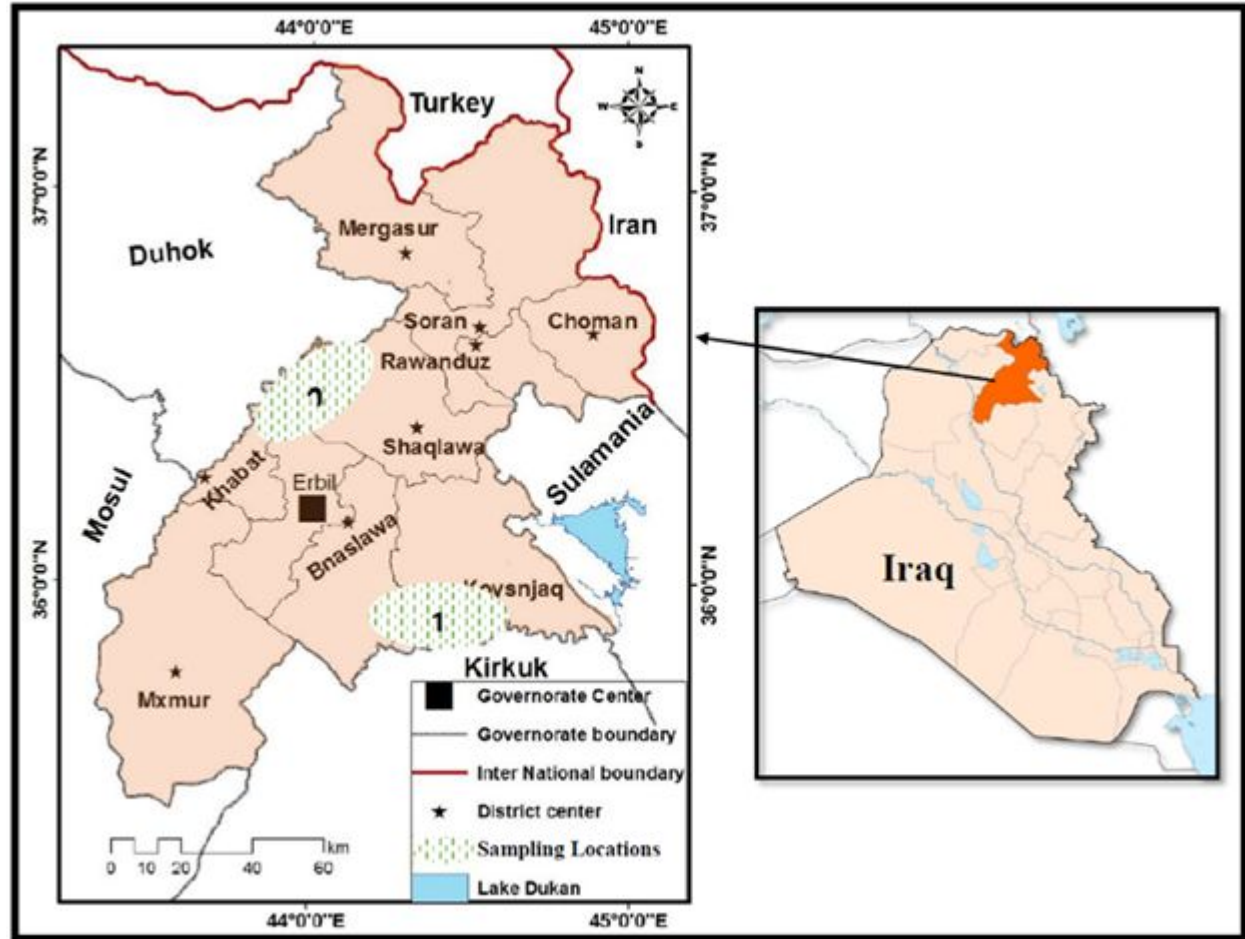
Abstract

Ambient environment is built base on interaction of living and non-living organism, chemical and physical compounds, thus oil field emissions, effluents and its general waste can be a part of environmental condition of certain area. This study is to investigate the environmental impacts of oilfield on sheep and cow meat around Shewashok oilfield. It is been performed at the Laboratories of the Department of Medical Microbiology / Koya University, by detecting, measuring heavy metals and vital trace elements as contamination indicators. 20 meat samples of domestic animals (Cow and Sheep) in both control and affected area were collected for the purpose of detecting the concentration of heavy metals in the animals. The samples dried and digested with concentrated HNO_3 and concentrated H_2O_2 . The concentration of heavy metals of the sample digested domestic animal were determined using inductively coupled plasma–optical emission spectroscopy (ICP-OES). This study show that, Iron, Cobalt, Copper, Zinc, Arsenic, Manganese, Aluminium, Mercury and Chromium were detected in all the meat samples. Overall this study confirms that, the Cow and sheep meat are still safe to eat in both locations, because only Al, Fe and Hg were found danger in both sheep and cow's meat in comparison with allowed limits of world health organization 2017, all other trace elements are complying with the global standards.

Introduction

- The Shewashok oil field
- Air, water and food are the basic needs
- Previous Researches
- Trace Elements
- Heavy Metals
- WHO standards

Study Area



Methodology

- ❑ Sample collection
- ❑ Used materials and chemicals
- ❑ Digestion procedure
- ❑ Inductively coupled plasma optical emission spectrometry (ICP-OES)
- ❑ Statistical analysis
- ❑ Comparison of the study observations with WHO standards for trace elements

Result and Discussion

First Section: Comparison of Study Area with Control Area

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Section Two: Comparing Study Area with WHO 2017 Standards

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Table 1

TABLE 1: Trace element concentration in control and study groups of sheep meat

Elements	Control group (ppb)	study group (ppb)	<i>P</i> value
Al	254.6±48.51	404.5±126.3	0.275
Fe	1941±295.2	474.1±121.2	0.0001
Hg	26.12±0.434	26.91±0.484	0.229
Mn	159.5±31.21	179.7±28.88	0.638
Zn	1006±100.9	1080±128.8	0.654
As	8.005±0.789	7.478±1.010	0.683
Co	0.000±0.000	0.266±0.116	0.028
Cr	0.000±0.000	0.752±0.347	0.037
Cu	492.6±61.65	1038±253.8	0.043

Results expressed as mean±SE

Table 2

TABLE 2: Trace element concentrations in control and study groups of cow meat

Elements	Control group (ppb)	study group (ppb)	<i>P</i> value
Al	186.2±31.59	278.7±41.19	0.08
Fe	1356±154.9	3720±534.3	0.0001
Hg	26.49±0.455	26.78±0.585	0.699
Mn	104.9±22.35	110.0±12.45	0.842
Zn	685.9±90.73	1688±264.4	0.001
As	8.015±0.812	6.256±0.950	0.171
Co	0.271±0.127	1.242±0.344	0.012
Cr	0.000±0.000	6.692±4.636	0.157
Cu	922.2±268.9	134.3±28.96	0.006

Results expressed as mean±SE

Table 3

TABLE 3: Comparison of study area with the WHO 2017 standards

Elements	WHO (ppb)	Study group (sheep) (ppb)	Study group (cow) (ppb)
Al	200	404.5	278.7
Fe	100-300	474.1	3720
Hg	1-6	26.91	26.78
Mn	100-400	179.7	110.0
Zn	3000	1080	1688
As	10	7.478	6.256
Co	3	0.266	1.242
Cr	50	0.752	6.692
Cu	1000	1038	134.3

This table is made based on Tables 1 and 2 and the WHO standards for heavy metals 2017

Conclusion

- The present findings indicated that these trace elements, iron, cobalt, copper, zinc, arsenic, manganese, aluminum, mercury and Chromium were detected in all the samples.
- Only, Hg, Al, Fe, in both sheep and cow's meat presented high values for both groups in comparison with allowed limits of WHO 2017.
- But, overall this study confirms that, the Cow and sheep meat still safe to eat in study area, because only Al, Fe and Hg were found danger, but all other elements are complying with the global standards.

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