University of Khartoum
Department of Animal Nutrition
Post Graduate Collage
M.Sc In Nutritional Science

Seminar about:

Zinc and Manganese Status in Liver and Blood Serum of Camel, From West Omdurman – Sudan.

BY:

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Introduction:

Camel (*Camelus dromedarius*) is a very important animal because its providing nutrient resources for humans in several arid and semi-arid zones of subtropical and tropical regions where it represents often the only protein source. In hostile environment, where the availability of water is scarce and ambient temperature is very high. dairy camels can provide milk almost all the year in quantities greater than other domestic animals (Farah, 1996).
Zinc and manganese are essential Trace minerals for normal growth and reproduction and have many roles of formation organs in animals. (McDonald et al, 2010). Zinc is required for the structural and functional integrity of over 2000 transcription factors and almost every signaling and metabolic pathway is dependent on one or more zinc-requiring proteins (Beattie and Kwun 2004; Cousins et al, 2006). Manganese plays an essential role in many cellular processes including lipid, protein and carbohydrate metabolism and is used by a diverse array of enzymes (Andreini, 2008).
Trace minerals concentration differ in animal tissues as the result of the surrounding environment (feeding plant and soil contaminated with food) and animal absorption of these minerals (Rashed, 2004). However, Environment and climate changes such as desertification may affect the minerals contain in soil and water.
The main objectives of present study

to examine zinc and manganese level in liver and blood serum of camel obtained from Slaughter house at west Omdurman-Sudan.

More over, to Comparative between zinc and manganese level in liver and blood serum of She-camels and males.
Materials and Methods

This study has been carried on Camels over four to six year's age after Slaughtered Camels at Slaughter house Alsallam Omdurman—Sudan. The Collection of Camels Tissues Were done at Liver and blood samples.
Livers and blood samples were collected from Alsallam Slaughter house Omdurman- Sudan. on September 2013. And obtained from ten She-camels and ten males mature apparently healthy camels and maintained in thermos flask until exposed to Laboratory analysis.
Moisture content of liver was determined simply by evaporating the water and weighting the residue using forced draft oven method (Marshall, 1993). Clean crucible dried for at least 3 hours at 105°C.
Determination of ash content:

Ash was Determined by gravimetric method (Marshal, 1993). The Principle of the method is burn away all organic matter at a temperature of 500C-550C.
Tissues samples preparation and minerals level determination:

Taken 5 gram from samples of livers, then held in dry oven at 105°C for 18 hrs to determinate moisture content weighed and then transferred to ferans at 500-550°C for 3hrs, cooled and weighed sensitive balance to assess ash percentage, 10ml hydrochloric acid at 5 normality was added to sample then put it in water sand bath and filtrated with filter paper and it washed properly with distil water. Finally, completed the solution by distil water to measurable volume, this was done by use an atomic absorption spectrophotometer (Model SpectrAA 220 Fast Sequential and company Varian). The sample was prepared by technical manual of the atomic absorption spectrophotometer. According to (Elemer ,1996).
Blood was collected from mature apparently healthy of ten She-camels and ten males (4-6) year's age. These samples was obtained from jugular vein puncture before slaughtering and kept in test tube to collect the serum, under frozen condition for later use. The Blood sample was pleased in centrifuge under 3000 rotation for 3 minutes for more accurate separation from serum. Carefully shift pure serum to special sterile tube. To determine the concentration of zinc and manganese of blood serum. Samples was analyzed by Atomic Absorption Spectrophotometer (Model Spectr AA 220 Fast Sequential and company Varian).
statistical analysis program **SPSS** by using **t**-test methodology to determine mean value of **Zinc** and **manganese** status in liver and blood serum of camels.
The results
Table (1) The Dry matter, Ash content, Zinc and Manganese level in liver of She-camels and males.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Parameters Means ±SE</th>
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<tbody>
<tr>
<td></td>
<td>Mn (ppm)</td>
<td>Zn (ppm)</td>
<td>Ash (%)</td>
<td>DM (%)</td>
<td></td>
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<tr>
<td>She-camels</td>
<td>16.2±1.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>86.4±3.9&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.4±0.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>33.1±0.4&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Males</td>
<td>9.3±0.7&lt;sup&gt;b&lt;/sup&gt;</td>
<td>128.2±15.6&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.6±0.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>31.7±0.5&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Over all</td>
<td>12.8±0.1</td>
<td>107.3±8.6</td>
<td>6.5±0.2</td>
<td>32.3±0.3</td>
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</table>

Significant  | **   | * | Ns | * |

Values are means of ten samples of livers from She-camels and ten samples of livers from males.

** = level of significant  \( P <0.01 \).
* = level of significant  \( P <0.05 \)

SE = stander error
Ns = non-significant
Figure(1): Manganese and Zinc Level in the Liver of She-camels and Males (mg/kg)
Figure (2)  Dry Matter and Ash contain in the Liver of She-camels and Males (%):
Table (2) The Level of Zinc and Manganese in Blood serum of She- Camels and males (µg /100ml).

<table>
<thead>
<tr>
<th>Sex</th>
<th>Parameters Means ± SE</th>
<th>Mn</th>
<th>Zn</th>
</tr>
</thead>
<tbody>
<tr>
<td>She-camels</td>
<td>0.05 ± 0.002&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.024 ± 0.001&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Males</td>
<td>0.05 ± 0.001&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.015 ± 0.002&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Overall</td>
<td>0.05 ± 0.002</td>
<td>0.019 ± 0.002</td>
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</table>

Significant: Ns  
* = level of significant  P <0.05
SE = stander error

Values are means of ten samples of blood serum from She-camels and ten samples of blood serum from males.
Figure(3): Manganese and Zinc level in the Blood Serum of She-camels and Males (µg/100l).
Conclusion:

- Higher level of zinc in liver of males camel and low level of manganese when compare to the She-camels.
- Camel serum showed Low level of manganese and zinc but no sing of deficiency was observed.
- Manganese level in she-camels liver was higher than males.
Recommendations:

✓ further study to determine status of manganese and zinc in camels tissues from others area and organs.

✓ Also more study to determine levels of minerals in pasture of the grazing animals and giving trace minerals supplementation to avoid potential risk of deficiencies in camels population.
Thanks