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To investigate effects of a shifting high fat diet to normal fat diet supplemented with magnesium, zinc and chromium on biochemical parameters in rats with diabetes

Aly R. ABDEL-MOEMIN¹, Ashraf A. A. EL-MEGEID¹, Ebtessam Fath M. OMAR², Yasmeen F. ABD EL-MONEIM³, Dalia Mohamed TALAAT³ and Sonia Salah ELMARASY¹

1(Nutrition and Food Science Dept., Faculty of Home Economics, Helwan University)

2(Home Economic Dept., Faculty of Specific Education, Alex. University)

3(Home Economics Dept., Faculty of Specific Education, Fayoum University) Egypt

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ABSTRACT

Several minerals play an important role in modulating blood glucose and thyroid hormones. The aim of this study was to investigate the effect of individual and combined minerals; chromium (Cr), magnesium (Mg) and zinc (Zn) on blood glucose, lipid profile, kidney and liver functions, T3, T4 and TSH among obese diabetes rats. The study was carried out on 66 male Wistar rats (150-160g) for 90 days on two stages. First stage included 66 rats (6 of which were control) which were fed on a high fat diet (19% hydrogenated fats and 1% corn oil as a source of essential fatty acids) for 45 days. Second stage of the study included the same 66 rats (6 of which were control) which were injected with (150 mg Alloxan / kg b.w) to induce experimental diabetes and were then fed normal levels of dietary fat supplemented with individual and combined minerals; Cr, Mg and Zn at two levels (high and low). Results indicate that in the positive control rat group (PC) there was elevated cholesterol and triacylglycerol levels. While, rat groups supplemented with combined elements (at low and high levels) led to lowering cholesterol and triacylglycerol significantly ($p < 0.05$). In particular, Cr had improved triacylglycerol status. The vice versa was noticed in rat groups fed on diets supplemented with individual trace elements. Lipoprotein levels were increased in individual supplementation with zinc (20mg) and at higher levels of Mg, Zn and Cr. Cr, at higher levels (200 μg) led to significant reduction of the

VLDL-C compared with negative control (NC) group. Uric acid, urea nitrogen and creatinine were decreased significantly with diets supplemented with individual Zn at higher levels (20mg/ kg b.w). The combination at high levels showed reduction of uric acid, urea nitrogen and creatinine compared to NC. Conclusion: our results indicate that diets supplemented with combined elements led to improving the tested parameters in this study.

Key words: diabetes mellitus - rats - alloxan - lipid profile - liver function - thyroid hormones.