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"Evaluation of the weight gain of hepatic gluconeogenesis markers in animals submitted to a hyperlipid diet supplemented with beet stems and leaves (*Beta vulgaris* L.)"

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Abstract

The aim of this study was evaluate the effect of supplementation of beet stalks and leaves in mice fed with high-fat diet during 8 weeks. Beet stalks and leaves were added in the diet by three different ways: extract (HFEX), dehydration (180° C/45min - HFSL) and freeze-dried (HFLy). The weight gain and gluconeogenesis parameters were evaluated after 8 weeks.

Key words:

Obesity, gluconeogenesis, beetroot.

Introduction

Obesity is currently a worldwide epidemic related to excess adipose tissue, systemic inflammation, oxidative stress and development of insulin resistance. Bioactive compounds presented in foods are able to reduce the oxidative stress, thus these can be used as a nutritional strategy to . In this context, beetroot (*Beta vulgaris* L.) and its by-products (stalks and leaves) presents antioxidant capacity due their phenolic compounds. The aim of this study was to evaluate the effect of beet stalks and leaves supplementation on metabolic parameters and hepatic function in mice fed with a high-fat diet.

Results and Discussion

Forty swiss male mice were divided into five experimental groups: control diet (CT), high-fat diet (HF), high-fat diet supplemented with dehydrated beet leaves and stalks (HFSL), high fat diet supplemented with serial extract of dehydrated beet leaves and stems (HFEX) and high-fat diet supplemented with freeze-dried beet leaves and stalks (HFLy) during 8 weeks. Metabolic parameters and protein content of PEPCK in liver were analyzed.

Dehydrated beet stalks and leaves (HFSL) promoted less weight gain ($p < 0.05$) and reduced fasting blood glucose ($p < 0.05$) compared with HF group (Figure 1). The supplementation with beet stalks and leaves reduced the protein content of PEPCK in liver (Figure 2).

Figure 1. Metabolic parameters after 8 weeks of treatment. A: Weight gain (g). B: Fasting glucose

Figure 2. Western-blotting shows the PEPCK to Bactin ratio in the liver of CT, HF, HFEX, HFSL and HFLy. A: PEPCK/Bactina of CT, HF and HFEX; B: PEPCK/Bactina of CT, HF and HFSL; C: PEPCK/Bactina of CT, HF and HFLy.

Conclusions

Mice fed with a high-fat supplemented with dehydrated and freeze-dried beet stalks and leaves diet during 8 weeks improved metabolic parameters and decreased PEPCK, suggesting an attenuation of gluconeogenesis in the liver. However, further studies should be carried out to identify the bioactive compounds and its mechanism of action.

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