

## Article Information

Received date: May 08, 2015

Accepted date: May 21, 2015

Published date: Jun 05, 2015

## \*Corresponding author

Sung Jae Shin, Division of Science in the Academic Studio at Central Texas College, Killeen, Texas, USA, Email: ssjkfrihan@hanmail.net

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**Keywords** High protein diet; Excessive dietary protein; Oxidative damage; Marginal dietary protein level

## Letter to the Editor

# Does a High Protein Diet Induce Oxidative Damage?

Sung Jae Shin\*

Division of Science in the Academic Studio, Central Texas College, USA

## Letter to the Editor

The purpose of the present letter is to determine the marginal level of high protein diet which modulates oxidative damage. The author hopes that the determination of the marginal level of high protein diet which modulates oxidative damage could contribute to the research for oxidative damage, apoptosis, obesity, cell proliferation, differentiation or cancer.

Consumption of a high protein diet is of interest in terms of one of dietary interventions for weight loss. Camiletti-Moirón *et al.* [1] reported that a high protein diet induces oxidative damage to the brain in rats by means of lipid peroxidation or protein oxidation. In the paper, however, the diet contained 45% dietary protein for the high protein group compared to the basal protein group. If the diet contains more than the content (e.g., 60-80% dietary protein) in the experimental or clinical study, it is my opinion that an “excessive dietary protein” may be the suitable terminology for the level of dietary protein rather than a “high protein diet”.

In a previous paper, we reported that a high (33%) protein diet neither induces oxidative damage in mice, nor a low or a basal protein diet [2]. Furthermore, enhanced oxidative damage was observed by radiation only in the low protein group by means of DNA damage, lipid peroxidation or protein oxidation [2,3] and severe DNA damage was observed by radiation only in the low protein without vitamin E group [4]. We also reported that modification of radiation-induced oxidative damage is critical for reducing the damage due to accidental exposure, such as in the Fukushima nuclear power plant disaster, the Chernobyl nuclear power plant disaster and for performing successful radiotherapy, such as bone marrow transplantation [2]. These results suggest that a basal or a high protein diet could prevent radiation-induced oxidative damage. Mondal *et al.* [5] found that a high (27%) protein diet prevent arsenic-mediated reproductive toxicity and oxidative stress in adult female rats. These results by Mondal *et al.* [5] confirm our data and suggest that consumption of a high (27-33%) protein diet could prevent oxidative stress-induced toxicity and oxidative damage.

Protein is a major dietary component, and it is feasible to consume a high protein diet as one of dietary interventions for weight loss. In terms of this point, it is critical to determine the marginal dietary protein level which modulates oxidative damage. Based on the research [1-5], in the author's opinion, marginal level of high protein diet which modulates oxidative damage could be in the range between 33-44% since the high (33%) protein diet did not induce oxidative damage, but another high (45%) protein diet induced oxidative damage. Oxidative damage is the imbalance of pro-oxidation and anti-oxidation, and it could be a factor of carcinogenesis [6]. Based on the risk for cell proliferation, differentiation or cancer, prevention of oxidative damage is quite important. Therefore, the determination of the marginal level of high protein diet which modulates oxidative damage could be one of the main factors for cancer prevention and further study is needed to elucidate the correlation between a high protein diet and oxidative damage.

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