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**Short Communication**

# The effect of Soya bean on fecundity of female albino mice

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## Abstract

A study was conducted to investigate the effect of soya bean in the diet as a protein source on serum LH, FSH and estradiol as well as histological changes in the ovaries of 8 weeks old female albino mice. Results revealed significant increase ($P<0.05$) in LH, FSH and estradiol in the treated mice as compared with control group. Also histological results indicated increase in the numbers and diameters of follicles as well as size of corpus luteum in the soya bean fed mice. This study indicated that soya bean has some role in the fecundity of female albino mice.

**Key words:** Soya Bean, Fecundity, Albino Mice

## Introduction

Researchers and nutritionist are looking for plants of dual benefits (nutritional and medical) and identifying their medical activities to treat different kinds of diseases (Al-Flayh, 1986). Soya bean plant is of major nutritional importance since it is rich in proteins, fats, vitamins and minerals. It is also considered as the main feed for both human and animal. It is free from starch and for this reason it is considered a good food for diabetic patients (Al-Rawy, 1988). Some active substances of this plant such as isoflavone (genstine, diaidzen, coumestans) have similar chemical composition as oestrogen hormone (Han et al., 2002). The purpose of this study was to find the effect of this plant on some female hormones and histological structure of ovary of albino mice.

## Materials and Methods

The experiment involved 8 weeks old 20 white adult albino female mice in their second parity obtained from Animal House of Biological Techniques Research Center of Al-Jaeria. Experiment was carried out in Biology Department, College of Science for Women, University of Baghdad and was lasted for 2 months. All animals were randomly divided into 2 groups and placed in special cages under similar environmental conditions. The first group was fed soya bean source diet, whereas the second group was fed the control diet (table 1). Water was offered *ad libitum* to both of groups.

At the end of the experiment, randomly ten mice from each group were slaughtered and blood samples were taken into sterilized test tube. Serum was separated using centrifuge apparatus at 2000 cycle/minute for 10 minutes. Serum samples were Kept at 4ºC for future use. After slaughtering of mice, ovaries were removed and placed in physiological saline solution. All attached adipose and connective tissues were removed and processed for histopathology as described by Sztein et al. (1998).

Serum LH, FSH and estradiol were determined using commercially available Biocheck immuneassay kits.

### Statistical Analysis

The means were tested for differences using t-test at level 0.05.

## Results and Discussion

The present study revealed that ovarian hormones levels were significant higher ($P<0.05$) in soya bean treated mice as shown in table 2. Also the highest increasing ratio was in FSH and the lowest in LH. The increase in hormones concentration may be due to the

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**Table 1: Chemical composition of the diets for two groups**

| Feed ingredients | Soya bean (%) | Control (%) |
|---|---|---|
| Yellow corn | 33 | 33 |
| Soya bean | 20 | 11* |
| Wheat | 41 | 41 |
| Barley | 4 | 4 |
| Fat | 1 | 10 |
| $CaCO_3$ | 0.7 | 0.7 |
| NaCl | 0.3 | 0.3 |
| Mineral and vitamins | 0.1 | 0.1 |
| Cholin Chloride | 0.05 | 0.05 |
| Total | 100% | 100% |
| Calculated energy and protein | | |
| Crude protein | 19.52% | 19.75 |
| ME (kcal/g diet) | 3097.70 | 3102.50 |

*Non soya bean protein source

**Table 2: Means ±SE serum sex hormone levels of female albino mice**

| Group No. | Hormonal level | | |
|---|---|---|---|
| | LH (µ gm/ml) | FSH (µ gm/ml) | Estradiol (pg/ml) |
| Control | 0.91 ± 0.25 [b] | 0.53 ± 0.18 [b] | 30.07 ± 2.15 [b] |
| 20% Soya | 1.77 ± 1.14 [a] | 1.37 ± 1.05 [a] | 63.33 ± 3.92 [a] |
| Increasing ratio | 0.94 | 1.58 | 1.10 |

Means in the same column with uncommon superscripts differ significantly (P<0.05)

**Fig. 1: Growth and development of ovarian follicles in soya bean fed mice**

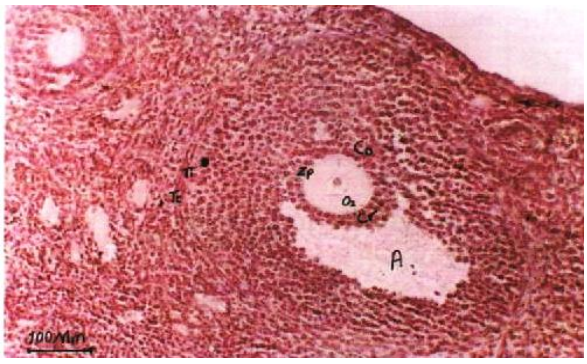

**Fig. 2: Growth and development of ovarian follicles in control mice**

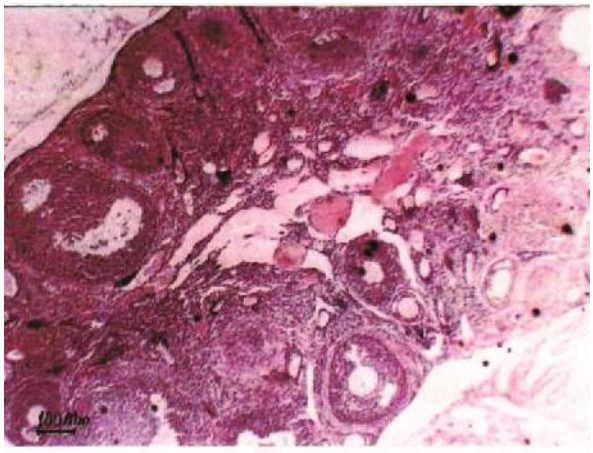

**Fig. 3: Increase in ovary size and an increase in number of developed ovarian follicles in the experimental mice**

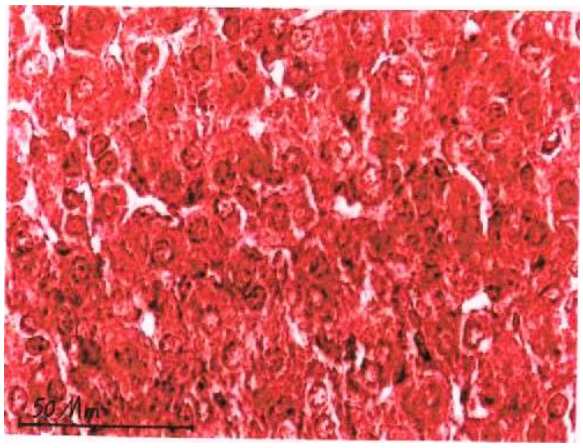

**Fig. 4: The increase in granulated cells in the corpus leutum of group 1 mice**

effect of soya bean on specialized cells that secrete LH and FSH. Soya bean may affect stimulation of pituitary gland cells to secrete both LH and FSH; this will increase their levels in the blood, which is necessary for oestrogen production. FSH stimulates growth of ovarian follicles as shown in Figures 1 and 2. Also LH is necessary to stimulate estradiol production from granulosa cells in ovary and causing ovulation (Guygton and Hill, 1996). Figure 3 illustrates increase in ovary size and an increase in number of follicles. Increase in the estradiol in female blood fed soya bean causes an increase in ovary size and the development (Cordle, 2004). Furthermore, the size of corpus leutum was increased in soy bean fed mice (Fig. 4).

Farnsworth (1975) stated that soya increases female's fecundity when it is used in a limited concentration in sterile female, since it increases the ovarian activity which stimulate ovulation through its active substance (Isoflavone).

From the above mentioned changes in this study indicate that using soya can increase the reproductive hormonal profile and stimulate proliferation and growth of ovarian follicles.

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