

EFFECT OF ROASTING ON NUTRITIONAL QUALITY OF PULSES

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Abstract:

In food particularly in legumes, so many factors are found which are considered as anti-nutritional and are not necessary for the human beings for utilized. All these factors are sensitive to the temperature. So in general practice pulses are processed before consumption. Roasting is the most accepted methods for removing the anti- nutritional factors. But on the other side it also reduces the protein content on pulses. In this research we evaluate the effect of roasting on different protein content of different pulses.

Key words: Legumes, Autoclave, Protein

Introduction:

Legume seeds are rich sources of protein for humans those cannot take animal protein. Due to rich content of protein pulses are also considered as the poor's man meat in developing countries (Singh et al., 2015). The pulses are underutilized due to the presence of certain compounds called anti-nutritional factors but now a day it is considered as the most reliable factors considered as an anti oxidant property (Philanto and Korhonen 2003). In literature many methods are suggested for removing these factors such as soaking, germination and roasting (Philanto and Korhonen 2003). Among all these methods roasting is the most accepted methods for removing these anti-nutrients and affects less on protein content. In this research we evaluate the effect of roasting on the protein content of pulses.

Materials and Methods:

The seeds of mung, masur, and arhar were procured from the local market of Indore M.P. India.

Protein extraction

Albumin and globulin extraction

The seed coats were removed and 50 gm of the powdered sample was defatted using chilled acetone. 300 mg of the sample was taken in a 2.5 ml of eppendorf tube. 1ml of chilled water was added to it and mixed properly. The contents were soaked for 12 hours at 4°C with regular shaking in vortex mixture. The contents were there after centrifuge at 10,000 rpm for 10 minutes in cold. The supernatant was collected to serve as a source of albumin (Sauvaire et al., 1984).

The pellet was collected and soaked in 1.5 ml of chilled 5 % NaCl which was maintained at 4°C for 6 hours to collect globulin fraction. The contents were then centrifuged at 12,000 rpm for 20 min in cold. The supernatant was designated as globulin fraction Sauvaire et al., 1984. Protein estimation was done following the method of (Lawry et al., 1951).

Total proteins.

The defatted seed was homogenized using 0.1 M Tris- HCl buffer (pH: 7.5) in the ratio 1:10 (W/V). Total protein was extracted after centrifugation at 17,600 g for 20 min at 4°C and clear supernatants were used for analysis. (Jha and Ohri, 2002).

Results:

The result of the present study shows that autoclaving affects on the protein content of pulses are shown in the following table.

| S.No. | Before roasting (mg/gm) | After roasting (mg/gm) |
|--------|----------------------------|---------------------------|
| Mung | 1.94 | 1.56 |
| Massor | 1.5 | 1.38 |
| Arhar | 3.77 | 1.49 |

Table 1: Content of albumin protein on autoclaving

The maximum amounts of proteins are found in the arhar followed by mung and masoor. On roasting the quantity of protein adversely affected as shown in the following table. The maximum reduction of protein content was observed in arhar then mung and least effect was reported in masoor.

| NO. | Samples | Without roasting (mg/gm) | After roasting (mg/gm) |
|-----|---------|-----------------------------|---------------------------|
| 1. | Moong | 4.75 | 4.50 |
| 2. | Masoor | 5.72 | 3.62 |
| 3. | Arhar | 3.88 | 1.02 |

Table 2: Content of globulin protein on autoclaving

On analyzing the protein content of different pulses we found the considerable amount of globulin content in the pulses. The maximum amount was reported in the masoor and lowest was reported in the arhar. On autoclaving the maximum reduction of protein quantity was reported in the arhar which is almost 73.71% of protein content.

| NO. | Samples | Without roasting (mg/gm) | After roasting(mg/gm) |
|-----|---------|---------------------------|-----------------------|
| 1. | Moong | 0.88 | 0.81 |
| 2. | Masoor | 0.76 | 0.74 |
| 3. | Arhar | 1.15 | 0.924 |

Table 3: Content of total protein on autoclaving

On analyzing the protein content of pulses maximum amount of total protein was reported in the arhar and lowest quantity was found in the masoor. On roasting there is less reduction of total protein content of pulses. The maximum reduction was reported in the arhar and lowest was reported in the masoor. In literature it is mentioned that the total protein is more stable of heat as compared to other proteins. Our results are in agreement with the findings of (Neha et al., 2016).

Discussion:

To remove the anti nutritional products of pulses different methods are employed which is beneficial for humans in consumption. On roasting it is reported that there is less effect on the total protein of pulses which are positive sign. Legumes are known for their protein content so we can recommend the roasting procedure for consumption of legumes.

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