Abstract
The comparative effect of using some vegetal raw flours (Glycine hispida, Phaseolus vulgaris and Vicia faba), treated by autoclaving, introduced in the feeding white rats, was followed by the presented experiments. Feeding growing rats with diets containing raw grain legumes, as the main source of protein, reduce the rate of growth. This effect attenuates with the aging of rats. Inhibition of growth is the most evident in the consumption of raw beans (by 33% over the control group). Autoclaving reduces the level of anti-nutritive factors (with 0.2% - 36.73%) and decreases the growth inhibition (with 10.7% - 27.51%).

Keywords: feed, rats, vegetable, protein sources

1. Introduction
Soyameal dominates the use of protein in the E.U. animal feed sector, accounting for 55% of total protein material used (in protein equivalent terms). No other vegetable protein sources used – maize gluten feed, rapeseed meal, sunflower meal and pulses- come near soya meal in terms of importance [1].
The mayor advantages of heat treated fullfat soybeans over commercial soybean oil meals are – the higher temperature of heat treatments (over 135 C instead of 105 C) destroys more of the antinutritional factors in soybeans and possibly increases amino acid availability of the soy proteins[2]; the high content of oil means more energy, in a highly digestible form, that reduces the need of protein catabolisation for energy-yielding purposes; - the oil promotes also the absorption and metabolism of other nutrients and supplies linoleic acid, other essential fatty acids and phospholipids [1,2].

2. Materials and methods
The total of 49 rats obtained in three separate groups of 15 males and 15 females each.
The animals were allocated to groups E1-7 and were identified. Cages, feed containers and drinking bottles were also numbered to indicate the group. Experiments were carried out respecting the rules of animal protection [3,4]. The animals were provided a non-commercial diet. Feed products were manufactured in house and had following composition corn, barley, oat, wheat meal, fish meal, meat meal, blood meal, KB, SB, or FB (25%) raw or autoclaved , grind wheat and mineral - vitamin sources (Table1).
Table 1. Experimental groups

<table>
<thead>
<tr>
<th>Group/diet</th>
<th>Control</th>
<th>E1</th>
<th>E2</th>
<th>E3</th>
<th>E4</th>
<th>E5</th>
<th>E6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without KS, SB or FB</td>
<td>With raw SB</td>
<td>With raw autoclaved SB</td>
<td>With raw FB</td>
<td>With raw autoclaved FB</td>
<td>With raw KB</td>
<td>With raw autoclaved KB</td>
<td></td>
</tr>
</tbody>
</table>

1 Autoclaved at 1.5 atm and 30 min

3. Results and discussion

Chemical composition of raw and autoclaved KB, SB and FB showed differences between them to

Table 2. Chemical composition of raw and autoclaved SB, FB and KB

<table>
<thead>
<tr>
<th></th>
<th>DM (%)</th>
<th>CA (%)</th>
<th>OM (%)</th>
<th>CP (%)</th>
<th>CF (%)</th>
<th>Cf (%)</th>
<th>NFE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>raw SB</td>
<td>92.70</td>
<td>6.20</td>
<td>86.50</td>
<td>33.64</td>
<td>18.29</td>
<td>17.09</td>
<td>17.48</td>
</tr>
<tr>
<td>raw KB</td>
<td>88.16</td>
<td>4.64</td>
<td>83.52</td>
<td>20.75</td>
<td>15.50</td>
<td>1.78</td>
<td>50.54</td>
</tr>
<tr>
<td>Autoclaved SB</td>
<td>90.84</td>
<td>6.64</td>
<td>84.20</td>
<td>30.98</td>
<td>13.20</td>
<td>20.80</td>
<td>19.22</td>
</tr>
<tr>
<td>Autoclaved KB</td>
<td>88.05</td>
<td>5.50</td>
<td>82.55</td>
<td>21.02</td>
<td>10.99</td>
<td>1.81</td>
<td>47.94</td>
</tr>
</tbody>
</table>

The small differences in chemical composition can not explain differences in body weight of rats. In absence of significant differences at the beginning of the experiment, after the first week, the groups, which received autoclaved seeds, had higher weight. In spite of a closed mean initial body weight, at the end of experiment there are registered differences between groups due to inhibition level of antinutritive factors. Between pair groups, which received the same vegetable protein flour, a difference between the lot fed with raw flour and the one with treated flour is constantly observed, the second one being always higher (by 12% for S.B. and F.B. batches).

Autoclaving reduces the level of anti-nutritive factors (with 0.2% - 36.73%) and decreases the growth inhibition (with 10.7% - 27.51%). The determination of the autoclaving degree efficiency was performed using the Urease Index (UI), compared to the mean value of tolerated limits (0.2 ml N / g/min. at 30 degrees Celsius) and is illustrated in Fig. 1.

Figure 1. Ureaza Index of the vegetable protein flours
4. Conclusions

- Comparative to mean nutritive values, the raw chemical composition shows significant differences especially concerning fibre content (1.5-2.5 times higher)

- Autoclaving reduces the level of anti-nutritive factors (with 0.2% - 36.73%) and improves the performance of rats to all groups, especially to group feed with autoclaved KB

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References

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