DIETARY VALUE OF TRITICALE WHOLEGRAINS

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I IN BRIEF

• Assessment of nutrients – proteins and starch – in triticale wholegrains harvested in Latvia.
• Latvian scientists first reported of presence of lunesin in triticale that could provide potential health benefits.
• Next – clinical studies – analysis of triticale wholegrains and sprouted triticale glicemic index and insulin index.

II AIM

Aim of the study was to assess the macronutrient content in different triticale varieties (genotypes - Dinaro, 9403-97, 9405-23, 9402-3) harvested in Latvia.

IV METHODS

1. Triticale grain samples

Conventional triticale grain varieties:
• Dinaro;
• 9403-97;
• 9405-23;
• 9402-2

harvested in State Priekuli Plant Breeding Institute (Latvia)

2. Detection of protein and starch content

Grains were grounded in laboratory mill obtaining fine whole grain flour.

A spectroscopic investigations with an InfraRed model 1241 Grain Analyzer from Foss Tecator Abhas has been used for a measurement of protein and starch in triticale grains. The instrument had an extended wavelength of 570-1100 nm. [3]

V RESULTS AND DISCUSSION

Characteristics of winter triticale varieties according to their nutritional traits, 2012, data from State Priekuli Plant Breeding Institute

Content of proteins and starch in different triticale varieties:

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Mean protein content, %</th>
<th>Mean starch content, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS_{μg}=0.5</td>
<td>RS_{μg}=0.8</td>
</tr>
<tr>
<td>Dinaro</td>
<td>9.7</td>
<td>69.0</td>
</tr>
<tr>
<td>9403-97</td>
<td>10.3</td>
<td>67.4</td>
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<tr>
<td>9405-23</td>
<td>11.0</td>
<td>67.6</td>
</tr>
<tr>
<td>9402-3</td>
<td>10.0</td>
<td>68.4</td>
</tr>
</tbody>
</table>

Scientific team from Latvia also detected a peptide lunesin in Dinaro variety (mean content 3.109 ± 0.029 mg/g grain).

Lunesin is a 43- amino acid long peptide that has been previously isolated from soybean, barley, rye and wheat.

Lunesin has potential anti-antioxidant, anti-inflammatory and anti-cancer properties.

Content of amino acids in winter triticale varieties

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Lysine, %</th>
<th>Threonine, %</th>
<th>Methionine, %</th>
<th>Arginine, %</th>
<th>Histidine, %</th>
<th>Lysine, %</th>
<th>Threonine, %</th>
<th>Methionine, %</th>
<th>Arginine, %</th>
<th>Histidine, %</th>
<th>Lysine, %</th>
<th>Threonine, %</th>
<th>Methionine, %</th>
<th>Arginine, %</th>
<th>Histidine, %</th>
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</thead>
<tbody>
<tr>
<td>Dinaro</td>
<td>0.36</td>
<td>0.33</td>
<td>0.54</td>
<td>0.70</td>
<td>0.37</td>
<td>0.48</td>
<td>0.11</td>
<td>0.96</td>
<td>0.25</td>
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<td></td>
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<tr>
<td>9403-97</td>
<td>0.57</td>
<td>0.35</td>
<td>0.57</td>
<td>0.74</td>
<td>0.31</td>
<td>0.51</td>
<td>0.12</td>
<td>1.04</td>
<td>0.27</td>
<td></td>
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<tr>
<td>9405-23</td>
<td>0.38</td>
<td>0.36</td>
<td>0.59</td>
<td>0.76</td>
<td>0.39</td>
<td>0.52</td>
<td>0.12</td>
<td>1.07</td>
<td>0.28</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9402-3</td>
<td>0.37</td>
<td>0.34</td>
<td>0.55</td>
<td>0.71</td>
<td>0.37</td>
<td>0.49</td>
<td>0.11</td>
<td>0.99</td>
<td>0.26</td>
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</tbody>
</table>

Conclusion and further scientific work

Triticale is an alternative wholegrain source for human diet and could potentially be a functional food due to lunesin content.

Our next research study will be linked with the grain effect in human body – we will determine glicemic and insulin index after triticale wholegrain and sprouted triticale wholegrain meal, as well for oats, hull-less oats, wholegrain barley, hull-less barley, rye and their sprouted meals.

• Serial experiment,
• 4-6 weeks long,
• 2 test groups,
• 15 persons per each

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References

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