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Differences in fish feed composition influence protein expression in the pyloric caeca in rainbow trout

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Aim

To investigate protein expression changes in fish gut (pyloric caeca) due to differences in feed composition.

Table 1: The main protein source in percentage of feed in the five types of fish feed.

<table>
<thead>
<tr>
<th>Feed</th>
<th>Feed A</th>
<th>Feed B</th>
<th>Feed C</th>
<th>Feed D</th>
<th>Feed E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish meal</td>
<td>61%</td>
<td>36%</td>
<td>36%</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Pea protein</td>
<td>18%</td>
<td>18%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood meal</td>
<td></td>
<td>8%</td>
<td>8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Principal component analysis of all 440 spots. The five different groups A, B, C, D and E are each represented by 3 samples. The first two principal components account for 33% of the variation within the samples.

Table 2: MS/MS based protein identification of spots from figure 2. Methods: Additional gels with increased amounts of proteins were run for identification using Maldi TOF/TOF. The MS/MS data were subjected to peptide mass search using MASCOT to search against all entries in NCBInr.

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Figure 2: Representative 2-DE gel of proteins from the pyloric caeca from rainbow trout. Proteins of interest based on ANOVA and PLS analysis are indicated by arrows. White arrows designate that the protein has been identified with LC-MS/MS while black arrow designates that the protein have not been identified.

Conclusion

Fish feed influences protein abundance in the pyloric caeca. A number of digestive enzymes were among the affected proteins.

Differences in fish feed composition affects gastrointestinal blood flow, as indicated by differences in plasma proteins.