Examination of the Potential of a Mycotoxin Deactivation Product to Improve Growth and Nutrient Utilization in Juvenile Rainbow Trout (Oncorhynchus mykiss) Fed High Protein Distiller Dried Grains


Introduction

Dried distiller grains (DDGS)
• A byproduct of the ethanol industry
• Of increasing interest as a protein source for numerous fish species (Cheng and Hardy, 2004)

Concerns about using DDGS as animal feed
• Detectable mycotoxins in DDGS (Garcia et al., 2008; Wu and Munkvold, 2008)
• Variability in DDGS quality
• These factors could explain previously observed limitations in the utilization of DDGS as a fishmeal replacement by rainbow trout.

The purpose of the current study was:
• To determine apparent digestibility coefficients (ADCs) for three DDGS products
• To determine whether a mycotoxin deactivation product could improve the ability of DDGS to replace fishmeal in rainbow trout diets

Materials & Methods

In Vivo Digestibility Trial
• Three DDGS products (Wentworth, Valero, HPDDG)
• 70:30 blend with reference diet
• 15-30g fish/tank; Fed 2 wks
• Fish manually stripped to collect fecal matter

Feeding Trials
• 2x2 Factorial design
• Protein source
• Fishmeal or 50:50 FM-DDGS
• Biofix-plus (Biomin)
• With 0.2% and without
• Diets (Table 1) and Feeding
• 40% digestible protein and 20% crude lipid
• Balanced for digestible lysine, methionine and threonine and P
• Fed twice daily to apparent satiation
• Fish and Culture Conditions
• 30 fish/tank (3.9 ± 1.0g)
• 15°C recirculating system
• 13:11 diurnal lighting
• 8 wks

Dried distiller grains (DDGS)

Table 1. Diet composition

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>FM Average</th>
<th>HPDDG Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME (kcal/kg)</td>
<td>3.39</td>
<td>3.58</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>48.4</td>
<td>48.6</td>
</tr>
<tr>
<td>Lysine (%)</td>
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Discussion

The results from the current study demonstrated that when rainbow trout diets are balanced for digestible protein, lysine, methionine and threonine that 50% of dietary fishmeal can be successfully replaced by a HPDDG product without compromising growth or necessitating mycotoxin deactivator inclusion.

Table 2. DDGS Proximate Composition

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Conclusion

The results from the current study demonstrated that when rainbow trout diets are balanced for digestible protein, lysine, methionine and threonine that 50% of dietary fishmeal can be successfully replaced by a HPDDG product without compromising growth or necessitating mycotoxin deactivator inclusion. However, alterations in the feed manufacturing process may be necessary to ensure that the amount of fines is minimized.

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References


