**Topic Sheet No. 52**

**Autumn 2001**

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**Specific weight and feeding value of wheat**

**Trading contracts**

Most trading contracts require that the specific weight of wheat destined for animal feed is at least 72 kg/hl. Grain with lower values is out of contract and usually commands a lower price.

An HGCA-funded research project aimed to determine if specific weight and nutritive value are linked.

**Grain samples used**

A matrix of 16 samples of wheat (4 specific weights x 4 varieties) was used in feeding trials with poultry, pigs and sheep (Table 1).

**Animal feeding trials**

**Poultry**

Cage trials were carried out at Roslin Nutrition, Edinburgh, Queen's University of Belfast and Harper Adams University College, with adult cockerels, and male and female broilers respectively using the grain samples defined in Table 1.

Wheat was incorporated in all diets at a minimum of 65%. Diets were fed ad lib up to 21 or 28 days (starter diet) or from 21 to 38 or 28 to 38 days (finisher diet).

Other trials were also carried out at each location, including work with broilers in large or small groups.

In each trial one or more of the following were measured: liveweight gain, dry matter intake, liveweight gain: feed ratio, and apparent and true metabolisable energy. Figure 1 presents results from cage trials at Queen's University of Belfast. In these trials the Table 1 samples were used as well as a further 18 varieties covering a range of specific weights.

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**Table 1. Wheat samples used for feeding trials**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Very low</th>
<th>Low</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buster</td>
<td>67 (71)</td>
<td>71</td>
<td>73</td>
<td>78</td>
</tr>
<tr>
<td>Consort</td>
<td>69</td>
<td>71</td>
<td>73</td>
<td>78</td>
</tr>
<tr>
<td>Haven</td>
<td>60</td>
<td>66</td>
<td>71</td>
<td>76</td>
</tr>
<tr>
<td>Riband</td>
<td>64</td>
<td>69</td>
<td>73</td>
<td>78</td>
</tr>
</tbody>
</table>

Values in brackets were used in pig trials only.

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Several physical and chemical characteristics were measured on each of the 16 samples. Pour and tap density, 1000-grain weight and starch increased, while modified acid detergent fibre decreased, with increasing specific weight.

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**Action:**

- Understand what your potential buyers will require for animal feed contracts.
- Adjust your agronomy to meet those needs.
- After harvest assess the quality of your crop and its sales potential.
- Refer to the HGCA Cereal Sellers' Checklist
- If feeding home-grown wheat on farm do not adjust rations on the basis of specific weight.
- Be aware of the significance of these findings if selling wheat to a third party.
Specific weight and feeding value of wheat

Overall, specific weight had no consistent effect on chicken performance, no matter which aspect was assessed.

Pigs
Feeding trials over 20 days were carried out at University of Leeds on 954 hybrid pigs. Wheat diets were fed ad lib to growing pigs between 15 kg and 27 kg liveweight. Specific weight had no meaningful effect on pig performance, diet digestibility or diet energy value.

Sheep
Mature ewes were fed a maintenance wheat (+ straw) ration at the University of Leeds using the Table 1 samples. Wheat specific weight did not affect digestibility or energy value.

Significance of findings
Across all species, there was no relationship between specific weight within the range tested and any nutritional indicator.

Extensive trials with poultry and other trials with growing pigs and mature sheep failed to show significant differences in nutritional value between wheat of different specific weights.

Neither was any clear link established between the wheat varieties tested and their nutritive values to target animals.

Figure 1. Effect of specific weight on liveweight gain

The Home-Grown Cereals Authority (HGCA) has provided funding for this project but has not conducted the research or written this report. While the authors have worked on the best information available to them, neither the HGCA nor the authors shall in any event be liable for any loss, damage or injury howsoever suffered directly or indirectly in relation to the report or the research on which it is based.

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