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WHALEBy-PRODUCTSFORPIGFEEDING

By K. M. HOPE, B.Sc. (Agric.), Agricultural Adviser, V. E. WESTON, H.D.D., Manager, Denmark Research Station, and P. GARSTONE, M.D.A., Pig Husbandry Instructor, Muresk Agricultural College.

PIG feeding experiments at Denmark Research Station and Muresk Agricultural College in 1951 and 1952, were designed to investigate the value of whalemeal and whale solubles in comparison with meatmeal as protein supplements to a crushed wheat ration. Large quantities of whale solubles are available and, used efficiently, could greatly reduce the present shortage of protein supplements.

From the pig raiser's viewpoint the most important findings are:

1. Whalemeal and whale solubles can be fed successfully to pigs.
2. In the trial at Denmark in 1951 whalemeal proved equal to Midland meatmeal.
3. In the same trial and others carried out at the Muresk Agricultural College, whale solubles proved a satisfactory protein supplement but was slightly inferior to Midland meatmeal and whalemeal.
4. The best feed conversions (from 3 to 3½lb. of feed per lb. of liveweight gain) were obtained from rations containing a high proportion of protein. These rations contained the equivalent of ½lb. Midland meatmeal per pig per day from weaner to baconer or ¾lb. whalemeal or 9oz. of whale solubles. These supplements were fed with crushed wheat used at the rate of 1½lb. per day per each 30lb. liveweight of the pigs.

   This provides a ration in which the crude protein content is gradually reduced from 18% when the pigs are 60lb. to 13% when they are 180lb. liveweight.
5. Whale solubles were inferior to meatmeal when small quantities were used in conjunction with dried brewer's grains to give a combined animal protein—plant protein supplement to crushed wheat.
6. The combined whale solubles—meatmeal mixtures equalled Midland meatmeal as protein supplements to crushed wheat.
7. Whale solubles can completely replace meatmeal after 100lb. liveweight without any loss in performances.
8. Both whalemeal and whale solubles can be fed as the sole protein supplement to a crushed wheat ration from weaner to baconer without any harmful effect on the quality of pigmeat produced. All pigs presented attractive carcasses which graded well on appraisal and were highly commended by bacon curers.

DENMARK EXPERIMENT, 1951

All groups on standard crushed wheat ration at 1lb. per 30lb. liveweight plus following protein supplements. Pigs fed in pens.

A. 8oz. Midland meatmeal per pig per day.
B. 8oz. Babbage Island whalemeal per pig per day.
C. 6oz. Point Cloates whalemeal per pig per day.
D. 8oz. Babbage Island whale solubles per pig per day.

Because of the low calcium and phosphorus contents of whale solubles and Point Cloates whalemeal (see analyses), 2lb. of bonemeal was added to each 100lb. of the crushed wheat ration fed to groups C and D which brought the calcium and phosphorus levels closer to Group A.

To illustrate the effect of no protein supplement to crushed wheat, the results of Groups 1 and 4 in a pig feeding trial by Cullity and Dixon (1943) are given alongside the 1951 results.

Group 1 received 8oz. Midland meatmeal per pig per day as a supplement to the crushed wheat ration. Group 4 received crushed wheat only.
In the Smithfield or Hammond system of appraisal a pig scoring 60 points is a good commercial pig.

MURESK EXPERIMENT, 1951

All groups on standard crushed wheat ration plus following protein supplements. Pigs hand fed in paddocks.

A. 8oz. Midland meatmeal per pig per day.

B. 2oz. Midland meatmeal plus 4oz. dried brewers grain per pig per day.

C. 2oz. Whale solubles plus 4oz. dried brewers grain per pig per day.

D. 4oz. Whale solubles per pig per day.

Two pounds of bonemeal were added to each 100lb. crushed wheat fed to Groups B, C and D to bring calcium and phosphorus levels closer to Group A.

It was apparent from the comparison of Groups B and C that Midland meatmeal was a better animal protein supplement to dried brewers grains than was whale solubles.

Comparison of Groups A and D in the above trial with Groups A and D in the 1951 Denmark trial indicated that reduction of the amount of whale solubles from 8 ounces to 4 ounces per pig per day resulted in reduced growth and lowered efficiency of feed conversion.

The comparison of Groups A and B suggests that the lower protein level in B may have caused the reduced efficiency of feed conversion. The higher carcass score in Group A was due to the excellent eye muscle and streak development which is considered to be a result of the higher protein levels in their ration.

MURESK EXPERIMENT, 1952

All groups on standard crushed wheat ration plus following protein supplements. Pigs hand fed in paddocks.

MURESK, 1951.

### Group A

- **Meatmeal.**
- **Group B.** Meatmeal plus Brewer's Grain.
- **Group C.** Whale Solubles plus Brewer's Grain.
- **Group D.** Whale Solubles.
A. 8oz. Midland meatmeal per pig per day.

B. 8oz. Meatmeal per pig per day up to 100lb. liveweight. 
8oz. Whale solubles per pig per day from 100 to 180lb. liveweight.

C. 6oz. Meatmeal plus 2oz. whale solubles per pig per day up to 100lb. liveweight. 
2oz. Meatmeal plus 6oz. whale solubles per pig per day from 100lb. liveweight to 180lb. live-

D. 9oz. Whale solubles per pig per day.

Two pounds of bonemeal was added to each 100lb. of crushed wheat fed to Group D. This same addition was made to Groups B and C after pigs reached 100lb. liveweight.

Additional trials are being carried out to determine whether whale solubles proved satisfactory after 100lb. liveweight because protein requirements (Quantity and/or Quality) after that stage are lower than the levels we have been providing in our rations.

Acknowledgments.

Thanks are due to Watsons Foods Pty., Ltd., for permitting use of factory facilities at Spearwood for the carcass appraisals and to the factory staff for their ready co-operation. The whale solubles were donated by the Australian Whaling Commission and the dried brewers’ grains by David Gray & Co., Ltd.


MURESKE, 1952.

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B Meatmeal and Whale Solubles</th>
<th>Group C Meatmeal and Whale Solubles</th>
<th>Group D Whale Solubles</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of pigs</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Commencing weight (lb.)</td>
<td>61·5</td>
<td>60-75</td>
<td>59</td>
<td>57·5</td>
</tr>
<tr>
<td>Finishing weight (lb.)</td>
<td>182-25</td>
<td>180-5</td>
<td>180</td>
<td>170</td>
</tr>
<tr>
<td>Increase (lb.)</td>
<td>120</td>
<td>119</td>
<td>121</td>
<td>112·5</td>
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<tr>
<td>Days on trial</td>
<td>82</td>
<td>82</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>Rate per day gain (lb.)</td>
<td>1·46</td>
<td>1·45</td>
<td>1·47</td>
<td>1·36</td>
</tr>
<tr>
<td>Feed conversion (lb. feed per lb. l.w.t. gain)</td>
<td>3·28</td>
<td>3·33</td>
<td>3·28</td>
<td>3·47</td>
</tr>
<tr>
<td>Carcass score (max. 100 pts.)</td>
<td>69½</td>
<td>68</td>
<td>66½</td>
<td>66½</td>
</tr>
</tbody>
</table>

ANALYSES OF THE PROTEIN SUPPLEMENTS AND CRUSHED WHEAT.

Percentage Compositions.

<table>
<thead>
<tr>
<th></th>
<th>Midland Meatmeal</th>
<th>Babbage Island Whale Solubles</th>
<th>Babbage Island Whalemeal</th>
<th>Point Cloates Whalemeal</th>
<th>Dried Brewer’s Grain</th>
<th>Bonemeal</th>
<th>Crushed Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>7·9</td>
<td>49·4</td>
<td>6-30</td>
<td>6·15</td>
<td>10·0</td>
<td>5·8</td>
<td>10·9</td>
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<tr>
<td>Total Solids</td>
<td>92·1</td>
<td>50·6</td>
<td>93-70</td>
<td>93·85</td>
<td>90·0</td>
<td>94·2</td>
<td>90·1</td>
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<tr>
<td>Ash</td>
<td>4·43</td>
<td>4·55</td>
<td>29·2</td>
<td>2·73</td>
<td>3·11</td>
<td>65·92</td>
<td>1·52</td>
</tr>
<tr>
<td>Crude Protein</td>
<td>56·6</td>
<td>44·4</td>
<td>56·4</td>
<td>74·1</td>
<td>17·5</td>
<td>24·6</td>
<td>10·2</td>
</tr>
<tr>
<td>Crude Fat</td>
<td>16·9</td>
<td>0·5</td>
<td>5·4</td>
<td>15·4</td>
<td>2·5</td>
<td>4·2</td>
<td>1·5</td>
</tr>
<tr>
<td>Crude Fibre</td>
<td>4·0</td>
<td>Nil</td>
<td>0·5</td>
<td>0·4</td>
<td>14·8</td>
<td>0·6</td>
<td>2·7</td>
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<tr>
<td>Crude Carbohydrates</td>
<td>5·3</td>
<td>1·2</td>
<td>2·2</td>
<td>1·2</td>
<td>52·9</td>
<td>.....</td>
<td>73·2</td>
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<tr>
<td>Calcium Ca.</td>
<td>1·99</td>
<td>0·47</td>
<td>11·1</td>
<td>0·16</td>
<td>0·29</td>
<td>24·5</td>
<td>0·029</td>
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<tr>
<td>Phosphorus P.</td>
<td>1·17</td>
<td>0·404</td>
<td>4·95</td>
<td>0·41</td>
<td>0·38</td>
<td>11·2</td>
<td>0·239</td>
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<tr>
<td>Salt NaCl</td>
<td>1·32</td>
<td>1·55</td>
<td>0·61</td>
<td>1·03</td>
<td>0·18</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Iodine No. of fat (Wijs)</td>
<td>53·3</td>
<td>75-6</td>
<td>98·4</td>
<td>96·2</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
</tbody>
</table>

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