The Effect of Increased Feed Intake During Late Gestation on the Reproductive Performance of Sows

W. R. Walker, C. V. Maxwell, R. L. Hintz and K. Brock

Story in Brief

The effect which increased feed intake during late gestation has on the reproductive performance of sows was studied in a trial utilizing 77 Yorkshire sows and 45 Yorkshire gilts. Treatments were a normal level of feed intake (4 lb per head per day in summer and 5 lb per head per day in winter) throughout gestation and a high level of feed intake (7 lb per head per day in summer and 8 lb per head per day in winter) from 90 days of gestation to farrowing. Sows on the high intake treatment were fed a normal intake from breeding to 90 days of gestation followed by the higher feed intake to farrowing.

No significant treatment differences were observed for litter size, sow weight, sow feed consumption, creep feed consumption, or pig survival. A three-way interaction between treatment, parity and season of birth was significant.

The pigs from sows and gilts on the higher late gestation feed intake were consistently heavier at birth, 21 and 42 days and had higher survival rates, resulting in increased litter size and larger pigs at weaning. Sow feed consumption during the first 21 days of lactation and creep feed consumption by pigs during the last 21 days of lactation were also higher for sows and gilts on the high intake treatment.

Introduction

A low survival rate of baby pigs from birth to weaning is a major problem in the swine industry. Estimates of survivability range from 70 to 80 percent. One of the major factors that has been shown to influence survival in baby pigs is birth weight. Past research indicates that heavier birth weight in pigs results in increased survival to weaning. Early studies demonstrate that most of the weight, protein, calcium and phosphorus is deposited in the fetuses during the last 21 days of pregnancy. Since birth weight may be related to energy intake of the sow during gestation, the level of nutrient intake during the last trimester of pregnancy should have an influence on the weight and composition of the newborn pig, thus having a major effect on the pig's chances for survival.

This study was conducted to determine what effect total feed intake level of the sow during late gestation has on litter size, birth weight, pig survival and subsequent pig performance.

1981 Animal Science Research Report 231
Materials and Methods

A feeding study was conducted with 77 Yorkshire sows and 45 Yorkshire gilts to determine the effect on subsequent productivity of increasing the level of nutrition during late gestation. Prior to breeding, gilts and sows were fed a standard 14-percent crude protein corn-soybean meal ration. The specific feeding regime for each treatment through the entire gestation period is explained in Table 1. After farrowing, all sows were allowed to consume the 14-percent protein diet on an ad libitum basis throughout lactation. Creep feed was provided to pigs at 3 weeks of age and continued until weaning at 6 weeks of age. After weaning, all sows were returned to the prebreeding level of feed intake (4.0 lb per head per day) and rebred, when possible, on the first estrus.

Table 1. Feed intake for each treatment (lb)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Normal Intake</th>
<th>High Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gilts Sows</td>
<td>Gilts Sows</td>
</tr>
<tr>
<td>Prior to breeding</td>
<td>5 4</td>
<td>5 4</td>
</tr>
<tr>
<td>After breeding (day 1-90)</td>
<td>4 4</td>
<td>4 4</td>
</tr>
<tr>
<td>90 days (gestation to farrowing)</td>
<td>4 4</td>
<td>7 7</td>
</tr>
</tbody>
</table>

*Feed increased 1 additional pound during the months of December to February.

Results and Discussion

No significant treatment differences were observed for sow weight at breeding, 90 or 110 days of gestation, farrowing and 21 or 42 days postfarrowing (Table 2). Sows and gilts on the high intake treatment showed a
Table 2. Least square means for sow weight, sow feed consumption and creep feed consumption for each treatment

<table>
<thead>
<tr>
<th></th>
<th>Normal Intake (lb)</th>
<th>High Intake (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sow weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breeding</td>
<td>388.9</td>
<td>375.9</td>
</tr>
<tr>
<td>90 Days gestation</td>
<td>434.4</td>
<td>441.0</td>
</tr>
<tr>
<td>110 Days gestation</td>
<td>454.3</td>
<td>465.5</td>
</tr>
<tr>
<td>Farrowing</td>
<td>426.4</td>
<td>437.5</td>
</tr>
<tr>
<td>21 Days lactation</td>
<td>408.2</td>
<td>405.5</td>
</tr>
<tr>
<td>42 Days (weaning)</td>
<td>418.3</td>
<td>416.3</td>
</tr>
<tr>
<td>Sow feed intake (farrow to 21 day postfarrowing)</td>
<td>338.2</td>
<td>349.8</td>
</tr>
<tr>
<td>Creep feed consumption (21 days postfarrowing to weaning)</td>
<td>27.8</td>
<td>32.3</td>
</tr>
</tbody>
</table>

Tendency to gain more weight from 90 days of gestation to farrowing and lose more weight during lactation than sows and gilts on the normal intake treatment. In addition, sow feed consumption from farrowing to 21 days postfarrowing was higher in sows fed the high intake level during gestation (349.8 lb vs 338.2 lb for the high vs normal intake, respectively). Likewise, pig creep consumption from 21 days postfarrowing to weaning at 42 days postfarrowing was higher in litters from sows fed the high intake during late gestation (32.3 lb vs 27.8 lb for the high vs normal intake, respectively). These differences in sow feed consumption and creep feed consumption were not significant.

Differences in individual pig weight at birth, 21 and 42 days postfarrowing were significant, but interpretation is difficult due to a significant three-way interaction between treatment, parity and season of birth (Table 3). However, averaged by treatment, pigs from sows and gilts on the high intake treatment were consistently heavier than pigs from sows and gilts on the normal intake at each weight period.

The number of live pigs and the pig survival rate at birth, 21 and 42 days postfarrowing were not significantly affected by the level of feed intake of the sow (Table 4). It should be noted, however, that the trend for larger pigs at birth from sows and gilts on the high intake treatment resulted in higher survival rates for pigs at birth, 21 and 42 days postfarrowing, which in turn led to more live pigs at weaning (7.39 vs 6.86 for the high vs normal intake, respectively). The survival rate was improved by 9.4 percent at 42 days, and survival rate from 21 to 42 days was improved by 10.7 percent.

These data suggest that no significant benefits are derived from increasing the feed intake of sows during the last trimester of gestation. However, performance was consistently higher for sows and gilts on the high level of feed intake. With the high degree of variation associated with the reproductive traits, a study with more animals may be necessary to accurately determine the real effect which nutritional treatment during gestation has on subsequent reproductive performance.
Table 3. Least square means of individual pig weight for each treatment parity and farrowing season

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Parity</th>
<th>Season of birth</th>
<th>Birth weight (lb)</th>
<th>21 Days post-farrowing (lb)</th>
<th>42 Days post-farrowing (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal intake</td>
<td>Gilt</td>
<td>Jan-Mar</td>
<td>2.5</td>
<td>11.2</td>
<td>21.0</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Gilt</td>
<td>Apr-Jun</td>
<td>3.3</td>
<td>11.4</td>
<td>19.0</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Gilt</td>
<td>Jul-Sept</td>
<td>2.9</td>
<td>10.5</td>
<td>21.9</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Gilt</td>
<td>Oct-Dec</td>
<td>2.7</td>
<td>11.3</td>
<td>23.2</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Sow</td>
<td>Jan-Mar</td>
<td>3.0</td>
<td>11.9</td>
<td>21.5</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Sow</td>
<td>Apr-Jun</td>
<td>3.0</td>
<td>12.1</td>
<td>24.2</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Sow</td>
<td>Jul-Sept</td>
<td>2.4</td>
<td>9.4</td>
<td>21.9</td>
</tr>
<tr>
<td>Normal intake</td>
<td>Sow</td>
<td>Oct-Dec</td>
<td>2.8</td>
<td>12.5</td>
<td>23.7</td>
</tr>
<tr>
<td>Average for normal intake treatment</td>
<td></td>
<td></td>
<td>2.8</td>
<td>11.3</td>
<td>22.1</td>
</tr>
<tr>
<td>High intake</td>
<td>Gilt</td>
<td>Jan-Mar</td>
<td>3.1</td>
<td>10.5</td>
<td>18.3</td>
</tr>
<tr>
<td>High intake</td>
<td>Gilt</td>
<td>Apr-Jun</td>
<td>3.1</td>
<td>12.3</td>
<td>24.2</td>
</tr>
<tr>
<td>High intake</td>
<td>Gilt</td>
<td>Jul-Sept</td>
<td>2.9</td>
<td>12.1</td>
<td>22.6</td>
</tr>
<tr>
<td>High intake</td>
<td>Gilt</td>
<td>Oct-Dec</td>
<td>2.5</td>
<td>12.5</td>
<td>22.1</td>
</tr>
<tr>
<td>High intake</td>
<td>Sow</td>
<td>Jan-Mar</td>
<td>3.1</td>
<td>12.6</td>
<td>22.6</td>
</tr>
<tr>
<td>High intake</td>
<td>Sow</td>
<td>Apr-Jun</td>
<td>3.3</td>
<td>12.3</td>
<td>23.9</td>
</tr>
<tr>
<td>High intake</td>
<td>Sow</td>
<td>Jul-Sept</td>
<td>2.5</td>
<td>8.7</td>
<td>19.4</td>
</tr>
<tr>
<td>High intake</td>
<td>Sow</td>
<td>Oct-Dec</td>
<td>3.3</td>
<td>13.4</td>
<td>26.5</td>
</tr>
<tr>
<td>Average for high intake treatment</td>
<td></td>
<td></td>
<td>3.0</td>
<td>11.8</td>
<td>22.5</td>
</tr>
</tbody>
</table>
Table 4. Average litter size and survival rate

<table>
<thead>
<tr>
<th></th>
<th>Number of live pigs</th>
<th>Survival rate (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Birth</td>
<td>21 days</td>
<td>42 days</td>
</tr>
<tr>
<td>Normal intake</td>
<td>9.14</td>
<td>8.02</td>
<td>6.86</td>
</tr>
<tr>
<td>High intake</td>
<td>8.14</td>
<td>7.81</td>
<td>7.39</td>
</tr>
</tbody>
</table>

1Number of pigs born alive + total pigs born.
2Number of pigs alive at 21 days + number of pigs born alive.
3Number of pigs alive at 42 days + number of pigs born alive.
4Number of pigs alive at 42 days + number of pigs alive at 21 days.

Direct Comparisons of Antibiotics for Growing-Finishing Swine

C.V. Maxwell, D.S. Buchanan, W.G. Luce, D. McLaren and R. Vencl

Story in Brief

Two trials were conducted to make direct comparisons among antibiotics commonly used by Oklahoma swine producers. In the first trial, gain, feed efficiency and daily feed intake were similar for pigs receiving the non-medicated control diet and pigs receiving chlortetracycline, tylosin or bambermycins. Pigs fed bambermycins tended to grow more slowly than pigs fed the other treatments during the growing period. In the second trial, pigs fed virginiamycin grew 9 percent faster and were 5 percent more efficient than pigs fed chlortetracycline. The pigs fed virginiamycin also grew 6 percent faster and were 4 percent more efficient than pigs fed the non-medicated control diet during the growing period. During the finishing period, average daily gain was similar among all treatments. Chlortetracycline in the diet during the finishing period improved feed efficiency by 4 percent when compared with virginiamycin-fed pigs. Backfat thickness was greater in antibiotic-fed pigs. Results of these trials suggest that substantial differences in antibiotic responses are likely to occur. More direct comparisons are needed to formulate specific antibiotic recommendations over the wide variety of environmental and management conditions found among swine producers.

Introduction

Antibiotics have been used extensively in growing-finishing swine rations for three decades. Such wide acceptance is attributed to their established benefits of