



PORK BRIEFS

THE LATEST INFORMATION ON SWINE NUTRITION



Balancing Pig Diets

By Ken Palen

Reading many different articles will give you many different ways of balancing your pig diets. Your goals may be different than your pig genetic production opportunities. Some folks prefer to buy and balance the diets.

- a) Cheapest price per tonne of premix in complete ration.
- b) Cheapest cost per tonne of complete ration of all ingredients combined.
- c) Cheapest ration cost per pig marketed, taking into account feed efficiency and growth rates not just premix cost or ingredient cost per tonne as per a & b.

Today's building costs, heavy carcass weights shipped, strong genetic costs, high production sows are all putting pressure on pushing the envelope on barn utilization. Many farms need fast growth rates to not overcrowd especially finishing barn or need to consider cutting back on sow numbers in order not to overcrowd pigs. If not balanced correctly feed conversion may suffer as well.

BALANCE PROTEIN (AMINO ACIDS) FIRST

Getting the amino acid levels correct, which make up protein equivalency in diets is probably the best place to start. Some folks have tried feeding high levels of lysine with lower total crude protein but have found poorer feed efficiency. In a study by M. De la Llata, et al., at Kansas State University in 2000, it was shown that as more L-lysine was added to diets for pigs 63-109 kg body weight, they gained slower and converted feed poorer. He recommended to not supplement more than 1.5 kg of synthetic L-lysine per tonne of complete ration. Their experimental diets allowed 45 kg of soyameal to be replaced with corn. Figure I below shows the 'staves of a barrel', explaining the theory of why adding more than 1.5 kg lysine per tonne of complete feed may not work without adding other synthetic amino acids when reducing the soyameal level in the diet.

One of the most interesting pictures of how a bunch of different amino acids make up protein in diets and which ones are limiting is the old stave barrel picture which was explained excellently by Dr John Barber in 2010.

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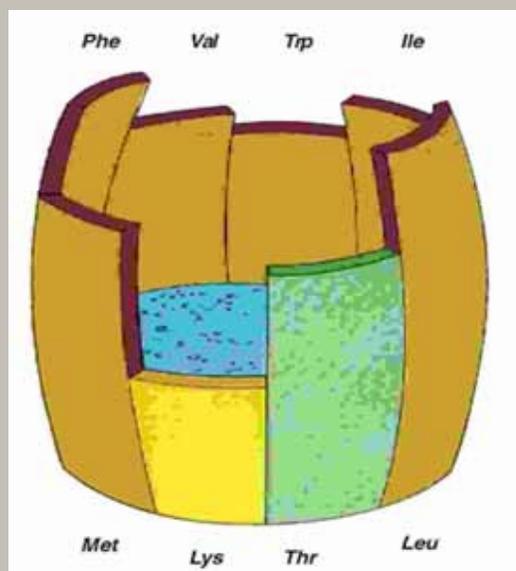
Reducing odours helps maintain a positive environment for the livestock and the people working with the livestock.

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Figure I



The height of each stave is proportional to the animal's requirements for a particular amino acid. If all the staves are high enough, then the barrel can be completely filled. However, if one stave is shorter, than the barrel can only be filled to that level. In a corn-soyameal ration for grow-finish pigs, lysine (Lys) is the first limiting amino acid. If adding more synthetic L-lysine and taking out soyameal, then other amino acids will become limiting and will need to be added from synthetic sources as well (Dr. John Barber, 2010).

A study by Ratliff (2005) at the University of Missouri showed that L-lysine can be added at higher levels (7 lbs/ton or 3.5 kg/tonne) to finisher pig diets (27-82 kg bodyweight), if up to 4 synthetic amino acids were added to balance the diets (National Hog Farmer; Funderburke, 2008).

ADDING TOO MUCH L-LYSINE

Even if adding up to a total of four synthetic amino acids including L-lysine, we can still reduce performance of pigs by adding too much L-lysine. A study conducted by Evonik Industries at the Louisiana State University Agricultural Center (2007) on 20-50 kg bodyweight pigs is shown in Table II below.

Table II

| Added L-Lysine HCl Equivalent (kg/t) | 0 | 1.47 | 2.44 | 3.33 | 4.23 |
|--------------------------------------|------|------|------|------|------|
| ADG (gms/day) | 739 | 714 | 740 | 708 | 663 |
| ADFI (kg/day) | 1.63 | 1.62 | 1.62 | 1.63 | 1.70 |
| F/G | 2.19 | 2.26 | 2.17 | 2.30 | 2.55 |

Adapted from Southern, L. (2007); Response of growing pigs (20-50 kg) to low crude protein diets supplemented with amino acids. LSU Trial report # P07-229

This trial shows reduced gain and poorer feed efficiency when L-lysine HCl Equivalent is added over 3.33 kg per tonne of finished feed. The trial results suggest that when adding 4.23 kg L-lysine HCl Equivalent per tonne of finished feed, other amino acids other than the four currently added may be limiting.

OPTIMIZE B-VITAMINS

A recent study on trying to optimize some B-Vitamins was done at Iowa State University in 2007 by T.S. Stahly and colleagues. Although not conclusive of which particular B-Vitamins are limiting, it did show that when five of the B-Vitamins (Riboflavin, Niacin, Pantothenic Acid, Vitamin B12 and Folicin) were added at much higher rates (up to 470% higher than NRC, 1998) to rations and fed to high lean pigs from 9-28 kg in bodyweight, there was an increasing linear response in gain (Figure II) and feed efficiency (Figure III).

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Figure II

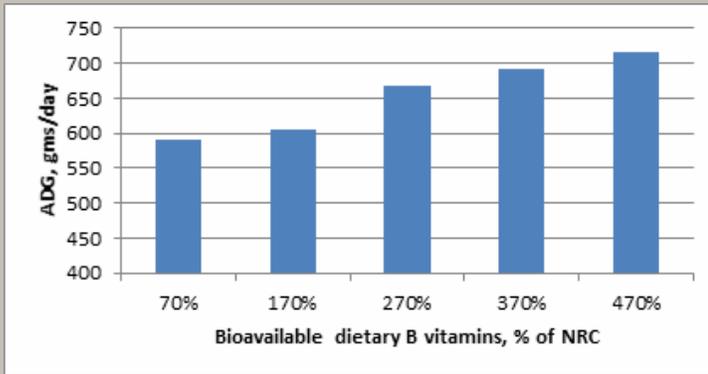
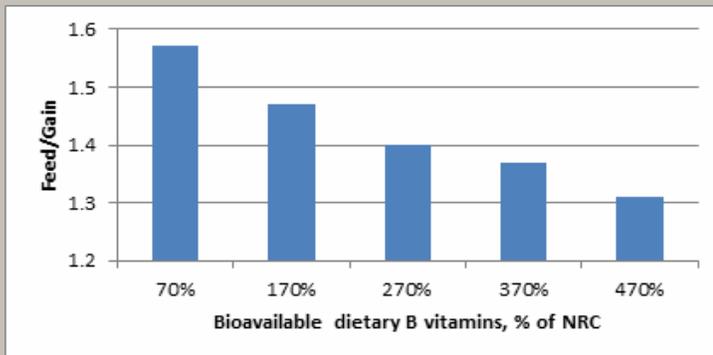


Figure III



Although more work needs to be done, this trial does show that today's modern leaner pigs need more B-Vitamins than in the past. Cutting costs by supplementing less B-Vitamins may not be the right option for today's pigs and with today's feed prices.

ADDING FAT

Recent research on today's genetics by Pettigrew at the University of Illinois shows that any fat source was better than none (Table III) and that 6% added fat was better than 3% added fat (Table IV). This trial was conducted on pigs that were 73 kg bodyweight at the start and fed for 66 days.

Table III – Any Fat Source Results

| G/F Pigs | FC |
|---------------|------|
| No Fat | 3.03 |
| Added Fat | 2.77 |
| % Improvement | 8.6% |

Table IV – 6% Added Fat Better than 3% Added Fat

| G/F Pigs | FC |
|---------------|------|
| 3% Fat | 2.86 |
| 6% Fat | 2.63 |
| % Improvement | 8.0% |

The researcher also found that feeding different sources of fat resulted in different performance; Choice White Grease showed a 7.6% improvement in gain and a 4.8% improvement in feed efficiency over feeding Soybean Oil.

FEED EFFICIENCY COMPARISON

Table I (25 kg to 130 kg Liveweight) 105 kg Gain

| Feed Conversion | kg Feed/Pig | Estimated Feed Cost/Pig | Feed Cost Savings/Pig | Equivalent Feed Cost Savings/Tonne |
|-----------------|-------------|-------------------------|-----------------------|------------------------------------|
| 3.00 | 315.0 | \$87.22 | -- | -- |
| 2.90 | 304.5 | \$84.31 | \$2.91 | \$9.56 |
| 2.80 | 294.0 | \$81.41 | \$5.81 | \$19.76 |
| 2.70 | 283.5 | \$78.50 | \$8.72 | \$30.76 |
| 2.60 | 273.0 | \$75.59 | \$11.63 | \$42.60 |
| 2.50 | 262.5 | \$72.68 | \$14.54 | \$55.39 |

Commodity Prices used - Soyameal \$475/t, DDGS \$230/t, Corn \$4.50/bushel

If properly balanced, pig diets can achieve as low as 2:5:1 feed efficiency with today's genetics even with heavier shipping weights to a limit of course. This chart above shows a potential saving or feed cost/pig of \$14.54 based on 105 kg gain.

Winter is a great time to review diet balancing opportunities. Great feed quality this year allows you to better evaluate which diets will work best for your farm this year.

Good Luck and Thank You.



We will be there!

Wednesday, March 7th 9:00 am - 5:00 pm

Thursday, March 8th 9:00 am - 5:00 pm

Friday, March 9th 9:00 am - 4:00 pm

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