Save $ with New Feeding Standards for Sows

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In the last few years, our new research in sow nutrition has provided evidence that the traditional feeding regimen of gestating sows needs revision. In particular, the change of amino acid (AA) requirements from early to late gestation and the energy deficit of young sows in late gestation indicate that phase feeding of pregnant sows may be advantageous.

Experimental data from our research group cover the requirements in early and late gestation for lysine (Samuel et al., 2010), threonine (Levesque et al., 2011a), isoleucine and tryptophan (Moehn et al., 2012 a,b). Amino acid requirements were determined using the indicator AA oxidation technique simultaneously with indirect calorimetry to measure energy expenditure.

Table 1. Lysine[1], threonine, tryptophan and isoleucine requirements of gestating sows

		1st parity	2nd parity	3rd, 4th parity
Lysine	Early/late gestation	15.0/18.0	13.1/18.4	8.1/13.0
Threonine	Early/late gestation	n/a[2]	7.0/13.6	5.0/12.3
Tryptophan	Early/late gestation	n/a	1.7/2.6	n/a
Isoleucine	Early/late gestation	n/a	n/a	3.6/9.7

[1]Srichana (2006) for 1st parity, [2]not available

Table 1 shows requirements were always greater in late than in early gestation, regardless of AA studied or parity of the sows. Secondly, the AA requirements always decreased as sows aged, regardless of AA studied or stage of gestation. The more than 2-fold differences in AA requirements make it impossible to feed all sows to their requirements using only one diet.

Energy expenditure of sows changed little during early gestation but increased significantly (+0.2 MJ/d SE 0.04) in late gestation, so that sows fed a constant feed allowance in pregnancy had negative energy balance in the last quarter of pregnancy. We found that sows had positive energy balance in early and mid gestation, but negative energy balance in the last quarter of pregnancy. Although this applied to all parities studied, older sows had less negative energy balance than younger sows. To achieve energy equilibrium, older sows need less additional feed in late gestation than younger sows. Because the sows maintained good condition despite the late gestation energy deficit when offered a constant feed allowance, early gestation feed can be reduced slightly in a phase feeding regimen. When feed allowances in early gestation are reduced by 10%, the phases of constant and increasing heat production intersect on day 85 of pregnancy. Therefore, the suggestion of GfE (2008) appears appropriate, to use early gestation feed allowances from breeding to day 84 of pregnancy, and late gestation allowances from day 85 to entering the farrowing room.

To control body condition, pregnant sows are fed restrictively. Therefore, energy intake is the limiting factor for gestating sows and, thus, the feed allowance to provide the necessary energy needs to be considered first when devising a sow feeding regimen. Generally, the feed allowance of sows is based on body weight and sow condition so that heavier and leaner animals are given more feed. For the purpose of this recommendation, ideal body condition is assumed.

Starting with typical feed allowances for the U of A sows, a phase feeding regimen can use 10% less feed from day 1 to 84 of pregnancy (Table 2). This creates 'space' to implement the increase of feed allowances from day 85 to farrowing. Based on energy expenditure, we estimated that the feed allowance of corn-based diets should be increased in late gestation by 600 g/d for gilts, by 500 g/d for 2nd parity sows and by 400 g/d for older sows. The mean daily feed intake of sows is a little less with phase feeding (Table 2) because of the slightly lower feed allowances in early gestation. The necessary AA concentrations for this parity segregated phase feeding regimen range from 1.0% lysine for late gestation gilts to 0.34% lysine for early gestation older sows.

Table 2. Daily feed allowance (kg/d) of a corn-soybean meal based diet for average sows in good condition in early and late gestation.

	1st parity	**2nd parity**	**3rd parity and older**
Early gestation (day 1 to 84)	1.8	2.2	2.4
Late gestation (day 85 to 112)	2.4	2.7	2.8
Average daily feed:			
Phase feeding	1.95	2.32	2.50
Constant allowance	2.00	2.40	2.50

The ideal implementation of a segregated phase feeding system is to blend two diets covering the greatest and lowest requirements to meet the needs of pregnant sows of all ages, stages of gestation and body condition. The parity-segregated phase feeding reduces feed cost because excess nutrient intake is avoided as is excessive feed allocation, e.g. in early pregnancy. The feed cost savings alone may exceed $10 per sow and year. Generally the savings are greater for older sows and for times with a large price differential between corn and soybean meal. In addition to the feed cost savings, parity segregated phase feeding may offer production advantages like better rebreeding of gilts, more even litters or improved sow longevity.

In conclusion, switching to parity-segregated phase feeding of sows will save feed costs by supplying nutrients in the right amounts at the right time.

References.

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