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Feed efficiency potential for pigs and poultry

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Introduction

With current input prices, feed conversion is one of the most important economic traits for swine production today and will be for the future. Depending on the region of production, feed costs account for between 68-75% of the total cost of production for pigs. With current input costs, 70% of the total cost of production for broilers is feed cost. Historically, cost of production has ranged between 55-62% of total cost for these species and a result more focus has been placed on genetic improvement of feed conversion as well as management and nutritional methods to improve conversion.

This paper will attempt to evaluate current potential for feed conversion in modern pigs and poultry operations and what are the opportunities for the future.

Pigs

One of the difficulties in comparing feed conversion potential across species or from operation to operation is the many different definitions of feed conversion. Historically feed conversion was measured as the pounds of feed required per unit of live weight gain but as changes in payment method, nutritional programs and management system (ie wean to finish versus two site production) has made it difficult to compare information across systems and between species. As a result, various new methods have been implemented to assess feed utilization including caloric feed conversion, carcass efficiency, etc. Although these systems have resulted in better ways to assess feed utilization, many of these systems are production system specific due to differences in nutritional program, type of production system and marketing programs or ending carcass weight. It is difficult to describe potential for feed utilization without accounting for these factors. For the basis of this paper, feed conversion per unit of gain will be utilized, but efforts will be made to describe the factors which influence this calculation.

Whole herd feed conversion is perhaps the best way to describe system feed utilization as it encompasses all aspects of the various production phases. Tables 1 and 2 below demonstrate performance from a commercial

system, some of the parameters that are used to estimate whole herd feed conversion and potential targets for what is achievable in a commercial system. Based on these estimates, whole herd feed conversion potential for mixed sex pigs is approximately 2.43 pounds of feed per pound of live weight pork produced.

Poultry (turkeys and broilers)

In order to estimate the potential commercial field performance of growing turkeys and broilers, current product guidelines for two major production crosses were utilized (Cobb 500, www.cobb-vantress.com and Nicholas 85 x 300, www.aviagen.com). Projected commercial performance for broilers and turkeys are demonstrated in Table 3.

Summary

Cross species comparisons can be done for feed conversion. In the examples explored in this paper, commercial performance potential for feed conversion is the greatest

Table 1: Sow production performance and feed usage per weaned pig (52 week period through May 2011)^a.

Criteria	Result
Farrow rate, %	95.3
Number of sows farrowed/week	271
Average total born	14.0
Average live born	13.3
Average weaning age	20.6
Pre-weaning mortality, %	6.9
Pigs weaned/mated sow/year	31.1
Average weaning weight, lb	14.7
Lbs gestation feed per day	5.6
Pounds lactation feed per day	14.2
Pounds of feed per weaned pig	71.5
Pounds of feed per pound of weaned pig	5.04

^a Camborough sows. Energy specifications (ME, NRC): Gestation = 1395 Kcal/lb and Lactation = 1460 Kcal/lb.

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for broilers, followed by pigs and then turkeys. Amino acid concentrations required for this commercial performance is greatest for broilers, intermediate for turkeys and lowest for pigs. Various factors can influence these results including management system, health status, feed manufacturing and use of growth promotants.

Table 2: Wean to finish performance and whole Herd feed conversion (52 week performance through May 2011^a.

Criteria	Result
Average start weight, lb	14.7
Average sale weight, lb	282.1
Average carcass weight, lb	215
Mortality + culls, %	3.2
Daily gain, lb/day	1.78
Daily feed intake, lb/day	1.78
Feed conversion, lb:lb	2.29
Whole herd feed conversion, lb:lb	2.43

^a Camborough × 337 Sired pigs. Energy specifications (ME, NRC): 1512 kcal/lb, Lysine:Energy = 3.08

Table 3: Commercial product performance for Cobb 500 broilers and Nicholas 85 × 300 commercial turkeys.

Criteria	Cobb 500 ^a	Nicholas 85 × 300 ^b
Weight started, lb	.31	.09
End weight, lb	33.0	8.01
Mortality, %	4.1	6.2
Age at slaughter, days	126	56
Average daily gain, lb/day	.261	.141
Average daily feed intake, lb/day	.679	.290
Feed conversion, lb:lb	2.60	2.05
Whole flock feed conversion, lb:lb	2.61	2.11

^a Nutrient specifications: Energy specifications (ME, kcal/lb) = 1421; Lysine:Energy = 3.77

^b Nutrient specifications: Energy specifications (ME, kcal/lb) = 1518; Lysine:Energy = 3.5



Production