

10 Questions based on Lifecycle Assessment/Analysis (LCA), and why I ask them.

1. What is your herd re-replacement rate per 100 original breeding replacement gilts over the first 6 production cycles / parities (P)?

The reason I ask is this.

If you apply the question to your herd records over a period of time the answer will be supplied by the Sow Retention Rate% for the period. Included here are two examples of breeding herds with 20 years of records.

	Production Cycle / Parity						
	1	2	3	4	5	6	
	Sow Retention Rate % of 100 Original Herd Replacement Gilts						Re- Replacement Gilts ¹
Herd A	93.58	86.78	80.54	74.14	65.89	51.12	34
Herd B	94.23	86.23	77.58	67.48	56.50	32.92	44

¹ This means the replacement gilts replacing the culls from the first 6 parities to maintain the continuous (rolling) herd output

2. What is your herd result for Sows per Pigs Weaned per Production Cycle (S/P/Y)?

The reason I ask is this.

Everyone can quote the herd result for Pigs Weaned per Sow per Year (P/S/Y) but as you can see from the reason for question 1., for every 100 herd gilts and sows through from P1 to P6 there are an extra number required to maintain the herd output by filling the empty spaces left by removed females through selective culling or mortality. The Sows per Pigs Weaned per Production Cycle from P1 to P6 is:

Farm A:

Pigs Weaned per Sow² per Year = 26.07.

Sows Weaned per 26.07 Pigs per Year = 1.43

Pigs Weaned per Sow³ per Year = 18.23

Farm B:

Pigs Weaned per Sow² per Year = 25.44.

Sows Weaned per 25.44 Pigs per Year = 1.66

Pigs Weaned per Sow³ per Year = 18.23

² This calculated using Conventional pig recording annual metrics

³ This calculated using the original data from Conventional pig recording and applying 3E LCA

3. What are the 3E economic, ethical, and environmental implications of the above LCA based answers for

The reason I ask is this.

The economic impact of the level of sow retention in a breeding herd is foundational to the overall operational financial liability of the business. Retention levels in the first two production cycles can create an economic vortex through the scale of continuous, operational loss. This then impacts the income capacity of the most productive production cycles from P3 to P5/6. Add to the is the answer to question 2. about the level of re-replacement of original replacement gilts and further pressure is put on economic liability. Time is another major cost, economic resource that is wasted in relation to the above answers.

The ethical impact is focussed on the selective/culling or mortality in each production cycle in terms of Animal Health & Welfare and the Well-being of the husbandry team in the discharging of responsibility in both consciousness and job satisfaction.

The environmental impact is rooted in the level of wasted resources that include, but are not exclusive to animals, feed, and within the time waste of the work, the excess carbon footprint of the husbandry team.

Farm A: P/S/Y 26.07...L/S/Y 2.35...weaned/litter 11.09 x 1.34 = 14.86...26.07 – 14.86 = 11.21
(11.21/26.07)x100 = 43%...S/P/W = 1.43

Farm B: P/S/Y 25.44...L/S/Y 2.18...weaned/litter 11.67 x 1.44 = 16.80...25.44 – 16.80 = 8.64
(16.8/25.44)x100 = 1.66

The reason is this:

Below is a series of three W/S/Y results from a continuous flow herd metric calculated by multiplying the weaned per litter result by the litters per year result. The advanced metric calculation for Sows per Pigs Weaned per Year (S/P/Y) is applied to demonstrate the basis of *commercial reality*

- 12.5 weaned/litter x 2.40 L/S/Y = **30.00** P/S/Y
- 14.6 weaned/litter x 2.40 L/S/Y = **35.00** P/S/Y

- 16.7 weaned/litter x 2.40 L/S/Y = **40.00** P/S/Y

However, if the annual herd turnover (replacement rate) is 50% then the true calculation is weaned per litter multiplied by the sow turnover rate of 1.50

- 12.5 x 1.50 = **18.75**. P/S/Y

- 14.6 x 1.50 = **21.90**. P/S/Y

- 16.7 x 1.50 = **25.05**. P/S/Y

The commercial reality is that it takes 1.60 sows per year to produce the original weaned per sow per year result when the replacement rate is 50%.

- 30 P/S/Y - 18.75 = 11.25 (+60%) = **1.60** S/P/Y

- 35 P/S/Y - 21.90 = 13.10 (+60%) = **1.60** S/P/Y

- 40 P/S/Y - 25.05 = 14.95 (+60%) = **1.60** S/P/Y

Sow retention

For the reason behind each question and to consider the Pig Farming Intelligence that drives each question visit www.hale-ag.com