**TECH TALK** 

## **Trace Mineral Source For Sows -Does It Matter?**

**Article Provided By:** 

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Trace mineral source for sows has significant productivity and economic benefits. Why do we care about further improving sow productivity beyond what has been achieved through genetic improvements over the last few years? Pork industry focus has long been on pigs weaned per litter. However, should we consider a different paradigm? A report by Gruhot et al., 2017 showed that margin per weaned pig and net return per sow is optimized at about parity 5. This suggests that focus should be on average parity at removal and pigs per sow lifetime. To demonstrate this, let us consider the difference in return per weaned pig at an average parity at removal of 3 compared to average parity at removal of 5. The Gruhot et al., 2017 data indicates that there would be \$1.07/weaned pig greater value on every pig from sows reaching parity 5 at removal compared to those removed at parity 3.



To achieve optimal economic return, we need to optimize pigs weaned per bred female, reproductive efficiency and sow longevity. The data demonstrates that MINTREX® trace minerals can help improve pigs weaned per litter, reduce non-productive days, improve farrowing rate and pigs per sow lifetime compared to sows fed solely sulfate-based trace minerals. Feeding MINTREX® trace minerals is associated with greater sow longevity. lida et al.,

Farrowing Rate %	96.49b	67.24ab	87.448	0.18	<.01
Replacement Rate %	48.55a	46.14D	46.00b	0.27	<.01
Mortality Rate %	9.48a	7.69b	7.20c	0.14	<.01
Locomotion Culling Rate %	18.61a	14.93D	14.85b	0.20	<.01
Sow 3P %	67.18c	70.69b	73.93a	0.25	<.01
Liveborn	13.02b	13.41a	13.50a	0.04	<.01
Piglets Weaned	11.53c	11.87b	12.12a	0.04	<.01
Preweaning Mortality %	11.42	11.43	10.18	2.13	0.85
				в	area et al, 201



Focusing on pigs weaned per sow per year and pigs weaned per sow lifetime are not mutually exclusive. We should focus on achieving the best of both worlds. Improving the key production indicators (KPI) of 1) farrowing rate, 2) total born, 3) birth loss, 4) pre-weaning mortality, 5) non-productive days and 6) bred gilt retention to parity 5 with help us achieve our dual goals. To fully understand the opportunity for improvement, additional production record analysis including parity at removal is often needed.



ITM: 100 ppm 2h from ZhO, 2s ppm Cu from CuSO4, 4s ppm from MnO OTM: same levels as ITM but s0% replacement with proteinate and amino add com trex\*: 50 ppm Zn, 10 ppm Cu, 20 ppm Mn Barea et al, 2019





For many producers, a cause of death is not sought for as many as 80% of sows found dead on the farm. Euthanasia can also account for a large percentage of total sow mortality. For example, in Lawrence and Hintz, 2021, euthanasia accounted for 50% of total sow mortality. Lameness and pelvic organ prolapse are often the primary reason for euthanasia. Regarding lameness, the productivity costs have recently been characterized by lida et al., 2019. The authors analyzed records for over 137,000 sows. Key findings showed lame sows had 0.8 fewer total born pigs, left the herd 1.5 parities earlier, were 2.2 times less likely to conceive at first breeding and had 0.7 more days wean to estrus. These findings highlight the productivity losses in pigs produced per sow per year, per sow lifetime, and contributions to non-productive days.

Voluntary culling rates are the largest driver of gilt retention and are often inflexible. Culling rate is often driven by system infrastructure that provides a constant replacement gilt supply. To achieve optimal pigs weaned per sow per year and per sow lifetime, we need to influence the culling reasons toward those driven by management decisions based on reproductive efficiency KPI's.

Therefore, current strategies utilizing all inorganic trace minerals in sow diets is limiting our dual goals of maximizing pigs per sow per year and pigs per sow lifetime. Further reinforcing that trace mineral source matters, farms where sows received MINTREX<sup>®</sup> trace minerals had the highest farrowing rate and sow mortality was lower than those receiving other trace mineral sources. Additionally, a greater percentage of sows achieved parity 3 and more pigs were weaned per litter compared to the other trace mineral sources. These results show that MINTREX® trace minerals can help optimize pigs per sow per year and per lifetime.

We have made our case: there should be a focus on pigs per sow per year and pigs per sow lifetime. This dual focus results in optimizing return per sow and weaned pig return. We began the article with the bold statement that trace mineral source for sows matters. When it comes to mineral nutrition, calcium, phosphorus, vitamin D and their interactions steal the limelight. However, trace minerals do heavy lifting as cofactors in hundreds of physiological processes absolutely necessary for health, reproduction and structural integrity. One of the largest demonstrations that trace mineral source matters was published by Barea et al., 2019. Productivity of 26 to 28 commercial sow farms for each of the three trace mineral programs were evaluated over a 2-year period. The sow farm size for each trace mineral program averaged 1,500 sows for a total of 39,000 to 42,000 sows per mineral program. At 2.4 litters per sow per year, the data in total represents 187,000 to 201,000 farrowing events per mineral program contributing to the data. The three mineral programs included 1) an all inorganic trace mineral program, 2) a combination of inorganic trace minerals with "organic" trace minerals which included data for farms fed a portion of the mineral as proteinates of amino acid complexes or 3) a reduced trace mineral program supplied as methionine hydroxy analogue chelates (MINTREX<sup>®</sup> trace minerals). The inorganic trace mineral program contained 100 ppm Zn as ZnO, 25 ppm Cu as CuSO4 and 45 ppm Mn as MnO. The organic trace mineral program had a similar total level

of trace minerals but supplied as a 50:50 blend of the inorganic minerals and either the proteinates or amino acid complexes. In contrast, the MINTREX® trace minerals supplied the sole source of Zn, Cu and Mn at a lower total level of 50 ppm Zn, 10 ppm Cu and 20 ppm Mn. The results showed that feeding all inorganic trace minerals resulted in a lower farrowing rate, higher sow mortality, greater lameness as a reason for culling, a lower percentage of sows retained to parity 3 and a lower liveborn and pigs weaned





Lawrence et al., 2021 also published results from a year-long commercial evaluation where two 3,500 sow farrow-to-wean units within the same production system. In this study, the inorganic trace minerals were supplied in the sulfate form. For the sows receiving MINTREX® trace minerals, 60 ppm Zn, 10 ppm Cu and 20 ppm Mn of MINTREX® trace minerals were substituted for similar levels of inorganic minerals. The results indicated that when fed a blend of MINTREX® trace minerals and inorganic minerals, 6% more bred gilts would be retained to parity 4 and 11% more retained to parity 5. Furthermore, farrowing rate was improved in the vast majority of parities and percent repeats were decreased across all parities. Wean-estrus interval was reduced in 7 of 8 parities and pre-weaning mortality was reduced in 6 of 8 parities. Combined, the results indicated that MINTREX<sup>®</sup> trace minerals could improve pigs per sow lifetime by as much as 6 pigs.

In a second recent trial, Lawrence and Hintz, 2021, a two-year demonstration was conducted at a single site comprised of two (2) sow units, housing approximately 2,500 sows each. In this trial one sow unit remained on the current feeding program with 125 ppm of Zn, 15 ppm of Cu and 30 ppm of Mn supplied as sulfate minerals (ITM Farm). For the other sow unit, 60 ppm of Zn, 10 ppm of Cu and 20 ppm of Mn in the sulfate form was substituted with MINTREX® trace mineral.

The results indicated that MINTREX<sup>®</sup> trace minerals were associated with an improvement of 0.7 more pigs per sow per year and 1.4 more pigs per sow lifetime. These improvements were achieved through 0.3 more pigs weaned per litter, a 1.0 percentage point improvement in farrowing rate and reduced non-productive days as a result of 1.0 percentage point fewer repeats and 2.5 percentage points more sows bred within 7 days. The field demonstration also showed that about 6% more sows fed MINTREX® trace minerals made it to parity 8 or beyond.



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