

LITERATURE SUMMARY: Value of garlic in lactating sows

By Joshua A. Jendza, PhD – Sr Research and Technical Services Manager, QualiTech, LLC

Introduction

Pig performance begins with the sow. The lactation period in particular sets the stage for subsequent health and growth of the litter, as well as heavily influencing the next reproductive cycle for the sow. A growing body of literature highlights the potential for garlic-derived products to enhance sow health and litter performance when fed during the lactation period.

Mode of Action

Garlic derived products have been shown to enhance the function of the innate immune system¹ in swine by altering expression of genes related to the innate and acquired immune systems (Table 1). The net effect is to improve innate immune function, thus reducing the need for nutrients to supply the much more costly acquired immune system² (Figure 1).

Table 1. Gene expression changes in swine induced by feeding garlic¹.

Gene Category	Gene Expression
Oxidation Reduction	↑9 (1.51 to 2.12×)
Defense Response	↑6 (1.57 to 1.74×)
Iron ion binding	↑6 (1.55 to 2.12×)
Fatty acid biosynthesis	↑3 (1.53 to 2.01×)
Antigen processing & presentation	↓5 (-1.55 to -1.76×)

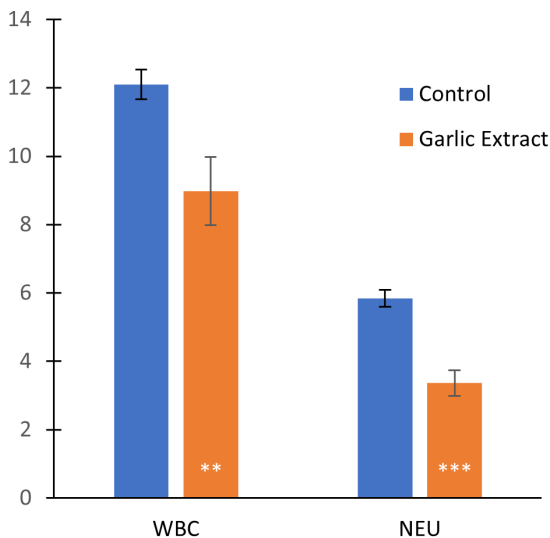


Figure 1. White blood cell (WBC) and Neutrophil (NEU) concentration (g/L) in sows 3 weeks pre-partum² (**P < 0.05; ***P < 0.01).

Benefits to Sow

This reallocation of nutrients has been reported to increase feed intake³ and reduce backfat losses during lactation^{4,5} (Figure 2), suggesting that garlic-fed sows were relying more on feed, and less on their own bodies for the nutrients needed for milk synthesis.

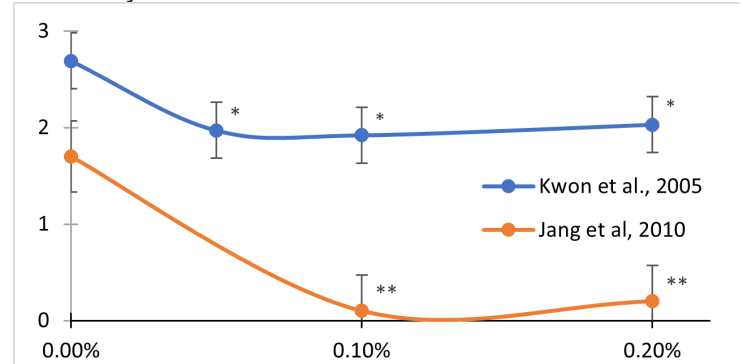


Figure 2. Backfat thickness losses (mm) in sows consuming a garlic-based botanical from farrowing to d21 of lactation^{4,5} (*P < 0.1; **P < 0.05).

Benefits to Piglets

Improved lactation performance in the sows fed garlic-derived products in turn leads to improvement in litter performance and metabolism.

- Increase plasma glucose³
- Growth performance³⁻⁵ (Table 2)
- Reduced activation of innate immune system²
- Reduced shedding of E. coli⁵ and enhanced Lactobacillus⁵

Table 2. Body weight gain of nursing piglets in response to supplementation sow diet with garlic-derived products³⁻⁵.

Item	Control (C)	C + 0.05%	C + 0.1%	C + 0.2%	P-value
Avg. Gain ³ (0-21d), kg	3.48b	4.56a	4.08ab	4.42ab	< 0.05
Litter Gain ⁴ (0-21d), kg	38.6b	n/a	40.6a	40.1a	< 0.05
Avg. Gain ⁵ (0-28d), g/d	228	n/a	235	240	< 0.01; Linear

Conclusions

Supplementation of sow diets with garlic-derived flavorings appears to support their innate immune system, to the benefit of the sow herself, and her growing litter. If you would like to explore the potential for garlic in your sow feeding program, contact your QualiTech representative.

References

- ¹ Liu et al., 2014. doi: 10.2527/jas2013-6496
- ² Satora et al., 2021. doi: 10.21521/mw.6447
- ³ Kwon et al., 2005. doi: 10.5187/JAST.2005.47.4.501
- ⁴ Jang et al., 2010. doi: 10.5187/jast.2010.52.2.103
- ⁵ Yun et al., 2019. doi: 10.1139/cjas-2017-0203